Equalization in a Federal State

An Economic Analysis

Robin Boadway Frank Flatters

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Equalization in a Federal State: An Economic Analysis

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1 An Introduction to the Issues

A continuing scheme of federal-provincial equalization payments has become an article of faith in political circles, despite the objections raised from time to time by some economists. So strong is the faith that virtually every serious suggestion for constitutional reform has advocated entrenching the principle of, and requirement for, equalization payments into the Constitution. This was true of the so-called Pepin-Robarts Task Force on Canadian Unity (1979) and of the Quebec Liberal Party's Beige Paper (1980). Indeed, enshrinement in the Constitution is now a fact of life, since it is part of the federal government's package for repatriation of the British North America Act.

Yet, however apparent it may seem to constitutional experts that a compact among regions must include provisions guaranteeing equalization to reduce regional disparities, among some economists there is a growing ground swell of opposition. It is not that these economists are opposed to reducing regional disparities; rather, they do not see equalization payments as an appropriate tool for that purpose. Indeed, many, following Courchene (1978), would argue that instead of reducing disparities equalization schemes may even worsen them. As these economists see them, transfers from high- to low-income regions cause a misallocation of the nation's resources and reduce the incentive for persons in the recipient region to work, save, migrate, take risks, and so on. Whole provinces, like individual welfare recipients, are placed in a state of dependency and have only limited incentive for self-development.

These are obviously important charges, the more so since regional disparities are considerable in Canada and equalization payments play a relatively large role compared with those in other federal systems. Yet the economics of the debate has not been carefully thought out; there has been no thorough formulation of the economic rationale for equalization payments. The conventional wisdom relies upon *ad hoc* statements of purpose or upon outdated concepts. Similarly, objections to equalization have, by and large, been based on simplistic analogies with the adverse effects of making substantial transfers to low-income persons. A proper analysis of intergovernmental equalizing transfers must take proper account of both the empirically observed features of the Canadian federation, including the nature of disparities, and the institutional features such as the division of economic powers between the federal government and the provinces. It is our intention to present an economic analysis of the appropriate role of equalization payments, if any, in a federal economy such as that of Canada. Our analysis will attempt to take account of the various ways in which disparities manifest themselves, and we shall explain our perception of the political distribution of economic powers.

The existence of regional disparities has been well documented in the literature. The reader is especially referred to the recent Economic Council of Canada study entitled *Living Together* (1977), where it is concluded that:

> ... no amount of juggling with statistics can lead any reasonable person to deny that economic well-being is sharply affected by the region in which one happens to be born or brought up. In short, disparities are real [p. 212].

More recently, the Department of Finance document entitled *Federal-Provincial Fiscal Arrangements in the Eighties* (1981), which accompanied the November 1981 Budget, calculated that the ability of the provinces to raise tax revenues at the national-average tax rate resulted in potential revenue varying from about $1,600 per capita in Prince Edward Island to almost $7,000 per capita in Alberta [p. 44]. Thus we can take it that there are significant fiscal disparities.

The Existing Equalization Scheme and Its Evolution

Although unconditional transfers from the federal government to the provinces have been with us since Confederation, equalization payments, as we know them, are a post-Second World War phenomenon. The use of equalization-type payments as a tool for interprovincial redistribution was first advocated in the momentous Report (1940) of the Royal Commission on Dominion-Provincial Relations [the Rowell-Sirois Commission]. Although their proposals in this regard were not adopted until some two decades later, the role of the Rowell-Sirois Report cannot be overestimated. Not only has the equalization scheme gradually evolved into one very much akin to that which the Rowell-Sirois Commission had suggested, but the rationale offered by Rowell-Sirois for a transfer scheme of such type and magnitude is still widely accepted in policy circles.

It is worth reminding ourselves of the context in which the Rowell-Sirois Report was written. The period was the late 1930s, when the consequences of the Great Depression were very much evident. Economic activity was still at a relatively low level, especially in the drought-striken Prairie provinces. Provincial treasuries, laden with the heavy cost of relief payments, were seriously depleted. The tax system was in some disarray. Provincial and federal governments occupied similar tax fields but used vastly differing tax bases and rates, thereby causing inevitable inefficiencies and inequities. The economic study of public finance was in its infancy, and economic data, especially on the provincial economies, were virtually nonexistent. Given the circumstances in which the Rowell-Sirois Report was conceived, it is quite remarkable (and a tribute to the insight of its members) that its proposals regarding fiscal federalism remain intact today with such an apparently wide degree of support.

At the risk of oversimplification, the Rowell-Sirois Report's proposals regarding federal-provincial fiscal arrangements can be said to consist of two interdependent parts, jointly aimed at improving the financial position of the provinces. First, it was proposed that the provinces should renounce the use of personal income taxes, corporate taxes, and succession duties. The Commission viewed this as being indispensable from the point of view of the efficient operation of the economy. At the same time, the federal government should refrain from competing with the provinces for the revenue sources left to the latter. In this way it was hoped to eliminate the inefficiencies and inequities arising from overlapping tax jurisdictions.

The second part of the recommendations can be viewed, at least in part, as a compensation to the provinces for their loss of revenue-raising power. The federal government was advised to institute a scheme of annual federal-provincial transfers, called National Adjustment Grants, to be allotted to provinces according to their shortfall between the provincial and local government expenditures required to provide the "normal Canadian standard of services" and the tax revenues that would be obtained from "taxation of normal severity." In fact, to select an enduring quote, the Commissioners stipulated "the amount, if any, which each individual province should receive from the Dominion annually to enable it to provide normal Canadian services with no more than normal Canadian taxation." In other words, provinces with below-the-national-average ability to provide normal services with normal tax rates were to be brought up to the national average with National Adjustment Grants. These grants, in conjunction with the take-over by the federal government of the net debt accumulated by the provinces as a result of the Depression, were intended to secure the financial position of the provinces. As discussed further below, the objective of the existing equalization grants varies little from that of the proposed National Adjustment Grants, despite the fact that provinces are no longer in any financial difficulty and that they jointly occupy the same lucrative personal and corporate tax fields as the federal government.

The exigencies of wartime finance precluded the Report from being acted upon, although some observers felt that it should have been, despite the war.[1] By the time the war had finished, circumstances had changed considerably; for example, the provinces had temporarily given up their power to levy personal and corporate taxes in the joint interest of the war effort. In the early postwar period the federal government continued to be the sole occupant of these tax fields and compensated the provinces by a system of tax rentals, which were actually per capita grants based upon population and the growth of the gross national product.[2] Since tax rentals were equal per capita grants to the provinces rather than payments based on the taxes actually collected by each province, they incorporated an element of equalization implicitly; this, however, was presumably different from that which would have resulted from the implementation of the Rowell-Sirois proposals.

In 1957 a major innovation occurred that effectively differentiated the equalizing role of federal-provincial transfers from the purely tax-collecting aspect. Tax rentals, which combined elements of both, were replaced by a system of tax sharing whereby the tax rebated to each province was based upon the taxes actually collected in that province. This was done initially by a system of tax abatements, but in 1962 these were superseded by Tax Collection Agreements whereby the federal government simply acted as a tax collection agency for the provinces, provided the provinces used the same tax bases (though not necessarily the same rates) as the federal government. This is the system still in existence today.[3] The same Act – the 1957 Tax-Sharing Arrangements Act – instituted a system of equalization payments from the federal government to needy provinces. Then, as now, equalization payments were based solely upon the tax capacity of each province and not upon any differences between provinces in the cost of providing "normal" services.

Initially, the only tax bases equalized were those of personal and corporate income taxes, and succession duties. Equalization was based upon the per capita tax yield of the two highest-yield provinces. The arrangements were to be renegotiated every five years. The first renegotiation resulted in the 1962 Fiscal Arrangements Act, under which equalization was calculated in a way similar to that of the preceding five years except that natural resource revenues were added. In 1967, the scheme was changed in two fundamental ways. First, the number of tax bases included was expanded from four to sixteen. Second, instead of using the top two provinces as the level to which needy provinces ought to be raised, the national-average-per-capita tax proceeds from each province from each tax source were calculated as the difference between the national average tax revenue and the tax revenue that would be collected by applying the national average tax rate to a province's actual tax base. In 1972, the number of tax sources in the formula was extended to 23 and in 1977, to 29 thereby covering almost all non-debt, non-grant sources of revenue to the provinces.

It is worth elaborating on the operation of the present scheme in more detail. The equalization formula is calculated on the basis of the following provincial revenue sources:

personal income tax
business income revenues
tobacco tax
sales tax
gasoline tax
diesel fuel tax
motor vehicle licences
    -commercial
    -noncommercial
alcohol taxes
    -beer
    -wine
    -spirits
health insurance premiums
payroll taxes
lotteries
succession duties and gift taxes
race track taxes
forestry revenues
oil and natural gas revenues
    -Crown oil revenues
    -freehold oil revenues
    -Crown gas revenues
    -freehold gas revenues
    -sale of Crown leases
    -other oil and gas revenues
mineral revenues
water power rentals
miscellaneous taxes and revenues
insurance premium taxes
federal government revenue shared with provinces
provincial property and school-purpose taxes.

Each province's equalization entitlement is calculated for each of the above revenue sources in the following manner. A common tax base is chosen for each source of revenue, and it is measured for each province and aggregated over all provinces to give the national tax base. Total principal tax collections are aggregated to give national tax revenues. National tax revenues divided by national population gives the national-average-per-capita-tax revenue – the norm against which a province's equalization entitlement is calculated. The national average tax rate is obtained by dividing the national tax revenues by the national tax base for each revenue source. This national average tax rate is then applied to each province's own tax base in per capita terms. The extent to which this falls short of the national-average-per-capita revenue from that source is the province's per capita equalization entitlement from that source. If it exceeds the national average, a negative entitlement is recorded. These per capita entitlements are converted to total entitlements by multiplying by the provincial population. They are then aggregated over revenue sources to give the aggregate equalization entitlement owing to the province. If the sum is positive, the federal government pays that amount to the province out of federal government general revenues. If it is negative, no sum is paid to (or collected from) the province. In practice, all provinces except Alberta, British Columbia, and Ontario have been recipients of equalization, although Saskatchewan is about to lose "have-not" status as well.

There are some rather important exceptions to the above rule – important because they have precluded Ontario from becoming an equalization recipient, as would have happened had the formula been applied exactly as stated above. (These exceptions will also turn out to be important when judged against the analytical results that are derived later in this study.) Nonrenewable resource revenues are not treated squarely with other revenue sources in the current equalization formula. In particular, only one-half of the provincial revenues from these sources are subject to equalization. Furthermore, total equalization payments on their account may not exceed one-third of total payments.[4] In practice, it is oil and natural gas revenues that are preponderant in this category. So great are the increases in these sources that the upper ceiling was expected to become binding in 1980/81. In addition, the federal government had announced that it would phase out equalization on account of the sale of Crown leases over a two-year period beginning in 1979/80.

It would be rash to attribute a particular motive to the federal government for initiating this downgrading of natural resource revenues in the equalization formula. Apart from the sheer expense to the federal government of equalizing the unevenly distributed oil and natural gas revenues, the treatment of these revenues in equalization cannot really be considered in isolation from the more general issue of the sharing of resource rents among the federal government and the provinces. In addition, there is the not unimportant observation that if resource revenues had not been treated in this way, Ontario would have become a recipient of equalization despite its relatively high per capita income from other sources. Politically, this would have been difficult to allow. There is a general view in some parts of the nation that Ontario has gained inordinately from the continuing protection initiated by the National Policy and that equalization is, in part, a *quid pro quo* on that account. These more general issues about the role of equalization provide useful speculation and grist for future research but are beyond the scope of this study.

The reader will probably not need to be reminded that the existing scheme expires in 1982, at which point a new agreement will have to be reached. Given the increased importance of oil and gas revenues as a source of provincial revenues and given its uneven distribution over provinces, the issues are likely to be contentious. This is especially so, since the treatment of natural resource revenues cannot realistically be separated from the underlying conflict over the jurisdictional claims to resource revenues. The federal government in its November 1981 Budget stated its preference for a scheme that includes all revenue sources fully but equalizes only to the Ontario tax capacity rather than the national average (thereby effectively excluding oil and gas revenues). This study is an attempt to bring economic analysis to bear upon the issues.

The existing system comes remarkably close to the type advocated by the Rowell-Sirois Report. It is designed to bring each province's resource revenue-raising capacity up to the national average. This enables the provinces to undertake average levels of expenditure at average tax rates, if they so wish. It is true that the Rowell-Sirois Report emphasized equalizing the ability to provide public services of average standard rather than simply equalizing the ability to spend. Different provinces, because of differences in cost or need, are able to convert given levels of spending into differing levels of public services. Given the difficulty in measuring these differences in cost and need, however, equalization of revenue capacity is probably the best that could be achieved. It is possible to incorporate elements of cost and/or need into equalization, as is done in a crude way in the U.S. revenue-sharing system, but the end result is bound to be very imprecise.

It is also rather remarkable how the perceived goals of the present system rely on the rationale first expounded by the Rowell-Sirois Commission. For example, compare with the latter the following statement of policy from the Federal-Provincial Tax Structure Committee (1966):

> The fiscal arrangements should, through a system of equalization grants, enable each province to provide an adequate level of public services without resort to levels of taxation substantially higher than those of other provinces.

Nor did the tenor of the argument change over the 1970s. Consider the following statement from Clause 31, regarding equalization and regional disparities, of the Liberal Government's Proposed Resolution respecting the Constitution of Canada (1981):

> Parliament and the government of Canada are committed to taking such measures as are appropriate to ensure that provinces are able to provide the essential public services referred to in para. (1)(c) [i.e., essential public services of reasonable quality to all Canadians] without imposing an undue burden of provincial taxation.

It is uncanny how the objectives of the Rowell-Sirois Report have survived, virtually unaltered, despite the passage of time and especially despite the circumstances. After all, the provinces are far from being in the state of financial crisis that characterized the late 1930s. We take this to be partly a reflection of the paucity of attention paid by economists to analysing in a thorough way the economics of federal systems. It might, of course, be argued that the above political goal is one that cannot be subject to economic criticism because it involves a basic value judgment about the objectives of policy. We do not take that view. If such a policy goal is justified, it must be based on the criterion that it makes individual persons better-off, using the usual economic yardsticks of efficiency and equity. Our analysis shows that it is a sensible goal when judged by these conventional economic criteria.

While economic analysis of equalization has been somewhat lacking, criticisms of the existing scheme and proposals for reform have not been. At the most fundamental level, some economists would presumably prefer that there be no equalization scheme. While Courchene (1978), for example, may not explicitly advocate its abolition, the tenor of his argument is that on economic grounds equalization is harmful. It essentially prevents the natural adjustment mechanisms of the economy from working by discouraging the mobility of factors of production, especially labour, from depressed to more advanced regions. The scheme is seen as one that causes a misallocation of the nation's resources. A complementary view is that, if redistribution is desired, it is best done by interpersonal rather than intergovernmental transfers. Thus some form of negative income taxation may be more sensible (although even this would result in efficiency costs in terms of reduced mobility). There also exist in the literature several proposals for reforming the existing system. Many authors have suggested converting the system from a so-called gross scheme to a net scheme. In other words, provinces whose equalization entitlement is negative should be required to pay sums into the scheme so that, on net, payments to "have-not" provinces would be balanced by receipts from the "have" provinces. The problem is particularly acute with respect to resource revenues, since these are typically tax sources to which the federal government has only limited access. Thus if the federal government has to pay large sums to equalize resource revenues, it has to obtain the financing from its own tax sources. The latter will typically not come from the same source geographically as the resource revenues that are being equalized; therefore the redistributive potential is limited. Partly to correct this deficiency, Courchene (1979) suggested moving part way to a net system by dividing the tax sources to be equalized into two tiers. The first tier would include personal and corporate income taxes, and sales taxes, and would be equalized in much the same way as at present. The second tier would include all other revenue sources and would be operated on a net basis. It should, of course, be noted that this proposal would not change the principle of equalization but only the mechanics of its operation.

It has been noted in the literature that there may well be a case for treating resource rents differently from other sorts of tax bases, particularly because the base of resource rents is less mobile among provinces and thereby susceptible to inefficiencies. Not only that, the existence of resource rents can cause misallocation of resources to the extent that labour is induced to migrate in order to capture its share of the rents. This point is discussed in Courchene and Melvin (1980), Flatters and Purvis (1980), and Helliwell (1980), as well as more obliquely by Usher (1977). The fact that there may also be some equity reasons for redistributing resource rents was noted in Boadway and Norrie (1980). These arguments, however, have yet to be incorporated into a more thorough analysis of equalization payments.

Finally, there are several authors who see some merit in simplifying the equalization formula *per se*; for example, Davenport (1979) suggested basing equalization entitlements on a single broad notion of income per capita, incorporating personal income, corporate income, and natural resource revenues. This would amount to a complete change in the nature of equalization from that of the Rowell-Sirois Report. The economic justification for such a formulation has yet to be made.

Part of our task will be to assess the validity of these arguments once equalization has been analysed more carefully from an economic point of view. The question of the appropriate role of equalization payments in a system that already has a formal structure of interpersonal transfers will be a fundamental part of our analysis. Prior to embarking upon the analysis, we consider it useful to present an all-too-cursory review of the existing economic literature on the topic.

The Literature on Intergovernmental Grants

The economics of equalization transfers is part of a wider literature on intergovernment grants. There are a variety of surveys already available, in varying degrees of sophistication;[5] so we shall confine our discussion to those aspects directly relevant to the Canadian case. The traditional literature has evolved around two sorts of issues. The first concerns the economic rationale for grants, while the second considers the appropriate form that the grants should take.

The Economic Rationale for Intergovernmental Grants

One can discern three sorts of arguments for grants from higher to lower levels of government in the literature. In what follows we shall refer to the higher level as the federal government and the lower level as the provinces, although the arguments obviously apply to other pairings as well, such as provincial and municipal governments. The first argument for grants is the existence of interjurisdictional *benefit or cost spillovers* and is a straightforward application of the theory of externalities. Collective expenditure decisions taken in one province may have beneficial or detrimental effects upon the residents of neighbouring provinces that are not accounted for by the price mechanism. There is no incentive for the spending province to take account of these benefits or costs in deciding upon its level of expenditures. Provincial governments are accountable only to their own residents, and if they were acting beneficently on their behalf they would expand the activity concerned until the marginal cost of additional spending just equalled the marginal benefit to those residents. If spillover benefits were generated, they would be neglected, and the spending province would undertake a level of activity that was less than socially efficient. There would therefore be a *prima facie* case for providing a subsidy incentive to the province to encourage it to expand its activity. A useful example of spillover benefits might be education or manpower training, the benefits of which would partly accrue to other provinces via migration. Conversely, if the spillovers were detrimental, too much would be produced, and the excess spending might be appropriately discouraged by taxing the provincial government's activity. Then, of course, the spillovers might also be reciprocal in that the spending of two provinces spilled over onto each other's residents, in which case "corrective" action would have to be taken against both provinces.

The theory of spillovers is widely accepted in the textbooks, and they are considered a justification for the sorts of specific intergovernmental grants that one observes in the real world. Yet we ought to be somewhat careful about applying economic arguments based upon individual behaviour (such as the theory of externalities) directly to government behaviour. The analogy may be incomplete for two reasons. First, while we may have some confidence in the rationality of individual behaviour, as exemplified by the use of indifference-curve analysis, the applicability of the same analysis to government decision making may be suspect. There is very little evidence of the rationality of government behaviour in selecting spending levels by setting marginal costs to collective marginal benefits, if for no other reason than the fact that benefits are not readily observable (to the outsider or to the government). Nonetheless, even if the model used is not exact, most economists would argue that its predictions are qualitatively correct; that is, activities with spillover benefits will be underprovided, and vice versa. Thus, although we may not know the correct size of the subsidy to provide or of the tax to impose on the provincial government, we at least know whether there should be one.

The second reason for exercising caution has to do with the fact that there are constitutional issues involved in providing provinces with incentives to change their spending patterns. If an expenditure responsibility such as health or education is explicitly given to the provinces, it can be consistently argued that federal attempts to interfere with provincial spending priorities by grants designed for that purpose, regardless of the economic efficiency arguments in its favour, are not in the spirit of the Constitution. This is especially so if the funds that finance the grants are derived basically from the same pool of taxable items as provincial tax revenues. It has always, of course, been argued by the provinces that federal conditional grants infringed upon their areas of spending responsibility.[6] There is a natural conflict between economic efficiency and the degree of decentralization of political decision making that is endemic to a federal system and that will appear again and again in this study. The issue cannot be settled on economic grounds alone; if it could, we would probably opt for a much more centralized federation than we have. It is worth making it quite explicit that decentralization of power to the provinces will often involve a conflict with economic efficiency (or equity).[7]

The second argument for intergovernmental grants, and one that partly motivated the Rowell-Sirois commissioners, is the possibility of a so-called *fiscal gap*. The argument goes as follows. Suppose the Constitution specified both a set of expenditure responsibilities and a set of taxing powers for the two levels of government. If the lower level of government chose the most preferred level of expenditure, the tax rates it would have to apply to finance such expenditures could be inefficiently high. In other words, if public services at all levels of government, as well as tax rates, were set at efficient levels and if the latter were set so as to collect the required amount of revenues in the most efficient way, the lower level of government might end up with a deficit and the higher level with a surplus, and a transfer to close this "fiscal gap" would then be desired.

It is very easy to misconstrue the meaning of the "fiscal gap" argument. It does not imply that provinces do not have the power to acquire the tax revenues needed to finance their expenditures; it means that if they were left to do so, they would either end up with too low a level of expenditures or too high a level of taxation from a national efficiency point of view. For example, if municipal governments had to meet all their expenditure responsibilities from the property tax and were given no grants by the provinces, the level of property taxation could end up being too high from an economic point of view in the sense that it might unduly retard capital accumulation. Alternatively, the municipalities might simply cut back their services.

There are several reasons why a fiscal gap may exist. One is that lower levels of government may be restricted to a limited number of tax instruments. Another is that, despite having the political power to levy a wide variety of taxes, there may be economic limitations on the extent to which lower levels of government can raise particular tax rates independently. This is the so-called problem of tax competition and arises when factors of production are mobile among provinces. A province acting independently may be reluctant to raise taxes for fear of losing, say, capital; alternatively, it may be overzealous in some cases, as indicated in later chapters. The problem does not exist for the higher level of government, but where it does exist it can be corrected either by the latter having a wider taxing power and then transferring some tax proceeds to the provinces or by collective agreement between the provinces and the federal government over the use of certain tax bases.

It is difficult to assess the importance of the fiscal-gap argument, especially since efficiency in the relative levels of taxation is difficult to quantify. Some will argue that the provinces have ample powers of taxation now and that no fiscal gap exists. If so, it is to a large extent due to the fact that the problem has been solved by the system of tax collection agreements covering personal and corporate income taxes, on the one hand, and by the large transfers under the Established Program Financing scheme and equalization, on the other. It seems clear that the notion of a fiscal gap, as applied to the "have-not" provinces, remains part of the motivation for the existing equalization program.

The final argument for interprovincial grants – and the one that has turned out to be the most controversial – is the argument of *fiscal equity* raised by Buchanan (1950). The notion of fiscal equity is an extension of the well-known public finance principle of horizontal equity to incorporate the net benefits to citizens from the activities of provincial governments. Loosely speaking, the horizontal equity criterion states that persons in like circumstances ought to be treated identically by government policy. Buchanan argued that persons otherwise identical but residing in different provinces would typically not get equal net benefits from provincial public sectors. Those in a "richer" province would get a higher ratio of benefits to taxes than those in a "poorer" province, since the former can get a greater amount of revenue from given tax rates than the latter. The difference between tax payments and benefits received Buchanan termed the *fiscal residuum*, and he argued that horizontal equity demanded that it be eliminated by a system of intergovernmental transfers. Furthermore, he argued that efficiency in resource allocation also required that the differentials in fiscal residue be eliminated. If they were not, people would be "inefficiently" drawn out of poorer regions and into richer ones. These arguments were enunciated in much the same way in the Canadian context by Graham (1964).

There arose a dispute in the literature involving Scott (1952) and Buchanan (1952) that was never satisfactorily resolved at the time. Indeed, the purpose of this study is partly to investigate the validity of Buchanan's argument. The basis of the dispute has to do with whether or not equalizing the fiscal residuum will improve or harm economic efficiency in the allocation of resources. Buchanan clearly thought that efficiency would be improved. His view was echoed by Graham (1964) who said:

> ... implementation of the fiscal equity principle is desirable, then, both on the ethical ground that it permits equal treatment of equals and on the ground that it is conducive to optimum allocation of resources.

Scott, on the other hand, took issue with this efficiency argument. Obviously both sides cannot be correct. Much of the difficulty in coming to grips with the issue arises from the imprecision of the concepts and the lack of even a semblance of a common formal framework for analysis. For example, it was never made clear in what sense one province was better-off than another. Was it due to natural resource endowments, productivity, or what? Nor was the tax side of provincial behaviour discussed explicitly. These issues are important in establishing the extent of the validity of Buchanan's argument. It will be seen that there is a grain of truth in both sides of the debate that can only be established with a more carefully outlined analysis.

After lying dormant for several years, the arguments for equalization grants were revived in the 1970s, once again at the instigation of Buchanan and his collaborators [Buchanan and Wagner (1970) and Buchanan and Goetz (1972)]. Now, however, the grounds had changed perceptibly to analysing the efficiency basis for equalization rather than the equity basis upon which the previous argument had rested. By efficiency was meant particularly efficiency in the allocation of the nation's labour supply, which was now assumed to be freely mobile across regions (i.e., provinces). Buchanan and Goetz argued that there was a *fiscal externality* associated with the migration decision of individual persons. In brief, in calculating the net benefits of migrating, the marginal migrant would ignore the effect of his moving on residents of the province from which he came (through lower tax payments and lower congestion costs) as well as on the residents of the province to which he moved (through higher tax payments and higher congestion costs).[8] Unless these were, by chance, offsetting, free migration would be inefficient. Although some commentators had earlier argued that these effects were pecuniary externalities and therefore not true efficiency costs – e.g., Feldstein (1970) – the more formal analysis of Flatters, Henderson, and Mieszkowski (1974) substantiated the conclusions of Buchanan and Goetz. They constructed a model of local governments providing local public goods and showed that the free migration equilibrium would be generally inefficient.[9]

The upshot of this literature was that there seemed to be an efficiency argument for "equalizing" transfers, to correct for the wrong market signals that potential migrants were obtaining. The results of these theoretical analyses, however, have not yielded any reliable policy directives. For one thing, even in the context of the simple models used, the magnitudes (and even the appropriate directions) of the transfers were hard to know with any certainty. They could just as likely go from rich to poor provinces as from poor to rich. Furthermore, the models were fairly simple planning models that did not explicitly model local government behaviour, especially the ability to levy various types of provincial taxes, including personal and corporate taxes, sales taxes, and royalties. Finally, a reading of the relevant literature will confirm that these fiscal externality arguments rely basically on the fact that provincial governments provide public rather than private goods. It can be shown that the fiscal externality argument disappears once it is assumed that provincial governments provide "quasi-private" goods.[10] In the analysis to be done in this paper we shall in fact make this assumption. Therefore, our arguments for equalization will not depend upon the "fiscal externality" argument. If such a fiscal externality existed, it would constitute a separate argument for intergovernmental transfers.

The existing scheme of equalization may be partly based on some notion of fiscal equity, since the latter is clearly related to the criterion outlined in the Rowell-Sirois Report. Fiscal equity, as that concept is used in the literature, however, is not likely to be the entire policy rationale for equalization. Fiscal equity is a notion based solely upon horizontal equity, whereas it seems likely that a considerable element of vertical equity or pure redistribution is implicit in political arguments for equalization. The appropriateness of equalization grants as a tool for nationwide vertical equity has not been studied carefully in the literature.[11] One of our purposes will be to introduce vertical equity among individual beings as an explicit goal of governments and see whether there are any circumstances under which that will lead us to want equalization payments as a policy tool.

The Appropriate Type of Grant

The form that intergovernmental grants should take depends upon the purpose for which they were instituted. It is worthwhile to begin with a widely accepted classification of types of grants. The most general distinction is between *conditional* and *unconditional grants*. Unconditional grants are transfers to the recipient government with no strings attached. They may be used in any way the recipient sees fit (even to reduce the tax revenues collected from its own residents). Conditional grants are given on the condition that they be put to specific uses – for example, to finance specific types of expenditures.

Unconditional grants may be further subdivided according to the formula used to determine the amount transferred to each unit. On the one hand, they may be allotted as equal per capita sums to each province, as were the tax rentals of the early postwar period. Similarly, the current Established Programs Financing grants are virtually equal per capita grants.[12] Alternatively, unconditional grants may discriminate among provinces according to such criteria as cost, need, tax effort, or tax capacity.[13] As noted, the equalization formula is an unconditional grant based upon differences in tax capacity relative to the national average.

Conditional grants can also be subdivided into *matching* and *nonmatching* grants, depending on whether the province is required to match some portion (or multiple) of the federal government grant in order to receive it. The Canadian Assistance Plan is a matching conditional grant, matching on a one-to-one basis federal for provincial expenditures on welfare. In other words, the federal government pays 50 per cent of all agreed-upon provincial expenditures. The Canada Assistance Plan matching grant is also *open-ended*, which means that there is no limit to the amount of matched expenditures that the provincial governments may undertake. Matching grants are *close-ended* if there is an upper limit to the amount of provincial spending that the federal government will match. The matching formula need not be 50 per cent; many programs have other rates.[14] If the grant is nonmatching, the entire sum for the program comes from the federal government.

Economic theory suggests that the appropriate form of grant for the purpose of correcting spillovers is a conditional, open-ended matching grant. The correct matching rate is determined by the share of the benefits spilling over to neighbouring provinces. Naturally it is virtually impossible to determine this with any degree of accuracy. As far as the fiscal-gap or the fiscal-equity criterion is concerned, unconditional grants are appropriate, since there is no particular reason to want to influence the pattern of provincial spending over types of expenditures. Economic theory, as noted, however, gives us precious little advice regarding either the magnitude or the formula for providing grants to satisfy these equity criteria. Nor does it, more generally, offer any guidelines for equalization payments should they be justified on grounds other than fiscal equity.

It will be the purpose of this study to investigate the case for equalization payments, starting from first economic principles. It will be found that, on both equity and efficiency grounds, there is a case for equalization payments of a particular sort. Moreover, the equity arguments incorporate both vertical and horizontal equity. The next chapter is devoted to an exposition, at the simplest, nontechnical level, of the rationale for equalization. This will be followed in subsequent chapters by slightly more technical analysis. Even there, however, we attempt to keep the analysis at a level accessible to nontechnical economists and policy makers.

2 Basic Assumptions and Principles

As will become abundantly clear when we proceed with the analysis, the nature and role of the appropriate equalization scheme depend critically upon, first, what one takes to be the proper criteria for judging alternate allocations of resources and, second, what one assumes to be the distribution of economic powers between the federal and provincial levels of government.

Some Fundamental Assumptions

Before we begin our analysis, we shall outline in detail our assumptions about these two matters. We shall adopt what we take to be the most widely accepted norms in this regard, either as used conventionally in economic policy analysis or as observed in actual policy making and constitutional practice. These assumptions are fundamental in the sense that they are used throughout the study. Specific assumptions regarding the structure and workings of the economy will be introduced when required in the analysis and will be altered from one case to another.

Welfare Criteria

The ultimate objective in economic policy analysis is to judge the different allocations of resources brought about by different government actions. By an allocation of resources we mean not only a particular mix of inputs and outputs, on the production side, but also a particular distribution of incomes among consumers. The kinds of policy instruments that we shall consider will be taxes (or subsidies) levied on individual persons or firms and intergovernmental transfers. These two kinds of instruments will generally influence both the production mix of the economy and the distribution of income. We need criteria for judging the various possible outcomes.

There is considerable controversy over the specific welfare criterion that one ought to use (i.e., the form of social welfare function), since the acceptance of any such criterion involves making strong value judgments, especially regarding interpersonal comparisons of welfare. Fortunately, our analysis does not require us to be so precise. Provided one is willing to accept as a welfare criterion certain minimal requirements that (though they involve value judgments) we consider to be widely held by economists, policy makers and the public, the cases for various types of equalization payments can be enunciated. The extent to which the scheme is implemented, like the progressivity of the income tax system, can then be left to policy makers, whose role it is to make specific value judgments on behalf of society. The minimal criteria that we have adopted are those typically used by applied welfare economists and are implicit in the advice given to economists and in observed economic policy itself. They are the sometimes conflicting goals of efficiency and equity.

Efficiency

Efficiency in the allocation of resources is derived from the notion of Pareto optimality. Resources are allocated efficiently when a change cannot make one person better-off without at the same time making another worse-off. If resources are not allocated efficiently, there will be some change that will make everyone better-off. A change that makes everyone better-off is called a "Pareto-improving change."

In analysing efficiency in resource allocation, economists often abstract from equity issues by assuming that the consuming side of the economy can be represented by a single, or representative, household. Equivalently, households can be taken to be different, but for the purpose of measuring welfare change, an additional dollar is taken to have equal value no matter to whom it accrues.[1] The adoption of this convention makes life rather simple for our analysis of efficiency in federal systems; thus we shall use it. For example, if the nation is a small open economy, facing fixed prices for goods and services, efficiency changes can be measured by changes in gross national product without reference even to the tastes of the representative consumer. If consumer prices are endogenously determined, changes in consumer surpluses become relevant as well.

The applicability of efficiency analysis to particular cases will be explained when appropriate in the analyses that follow. It seems reasonable to accept that improvements in efficiency, conventionally measured, are desirable, since virtually every economic and policy analyst does so either explicitly or implicitly. Fortunately, it often turns out in our analysis that efficiency and equity considerations reinforce, rather than conflict with, one another.

Equity

Equity is a rather more controversial criterion, since by its nature it requires one to make judgments regarding the relative well-being of different persons. In the public finance literature, it is traditional to distinguish between horizontal equity and vertical equity. Horizontal equity requires that like persons be treated equally; or, more specifically, if two persons have the same level of well-being before a change, they should have it afterwards as well. Vertical equity is concerned with the relative weight to be given to changes in the well-being of persons at different levels. The applicability of the criterion of horizontal equity requires that one be able to compare levels of well-being or the utility of different persons. Vertical equity requires, in addition, that changes in utility be compared.[2] In either case, it is useful to have an objective measure of utility or welfare.

The measurement of welfare is notoriously fraught with difficulties and dangers, and it is inevitable that one has to adopt an imperfect measure. The norm used here as an indicator for well-being is that used in the public finance literature: *real comprehensive income*. This is the sum of current consumption and additions to net wealth, both measured in real terms. It is the measure advocated by the Carter Commission (1966) as an appropriate income tax base, on equity grounds; and, apart from measurement difficulties, it is the ideal for which most personal income tax systems, including that of Canada, aim. The debate in the literature as to whether income or expenditure ought to be the base for taxation is well known and will not be recounted here. Suffice it to say that our analysis would apply regardless of which base was adopted. It ought to be emphasized here that the consumption part of comprehensive income ought to include all consumption services from which the consumer benefits whether they be provided by the private or the public sector and whether they be private goods or public goods, or something in between.

As an index of welfare, real comprehensive income, or simply *real income* as we shall refer to it, has some shortcomings even as an indicator of welfare levels for horizontal equity purposes.[3] For example, leisure is typically not included as a "good" in calculating real income because it is difficult to measure. If two persons, otherwise identical, have different preferences for leisure, real income will appear to be higher for the one who takes less leisure and consumes more goods even though, on welfare grounds, the two persons concerned may be equally well-off. The same applies to other nonmeasurable or nonpecuniary items accruing in differing amounts to different persons. Indeed, if persons have different tastes, it is not obvious what measure one could concoct in theory that would be adequate for horizontal equity purposes. Our analysis will do nothing to solve this problem. We shall take real income as conventionally conceived to be an appropriate norm for equity purposes, despite its shortcomings. Our concern will be to ensure that real income, as such, is properly accounted for, taking into consideration government activities at both federal and provincial levels.

The use of real income as an index of economic welfare enables us to determine whether two persons have the same level of welfare; thus it can be used as a basis for designing a federal tax structure that is horizontally equitable. To apply the concept of horizontal equity, however, one needs to be able to do more than simply compare existing levels of welfare. A fiscal system that is horizontally equitable is one in which any two persons who were equally well-off before its introduction would also be so after its introduction. The applicability of this criterion, even using real income as a measure of welfare levels, poses two additional problems; one is informational, and the other is judgmental. The informational problem has to do with the fact that while we can observe real incomes *ex post* we cannot observe them *ex ante* (i.e., before the change in fiscal structure). For example, imagine a general income tax applied at the same rate to income from all sources. If the incidence of the income tax were such that the relative returns to property and to labour changed as a result of the tax, the general income tax would not be horizontally equitable, since two persons with identical incomes before the tax but yet with differing proportions of property and labour income would have different after-tax incomes. An "ideal" tax system would treat the two sources of income differently. Since one cannot observe the relative pre-tax positions of persons, it would not be feasible to design a tax system that was perfectly equitable horizontally. This source of inequity in income tax is typically ignored, as it will be in this study; that is, we shall only require that two persons with the same real income *ex post* pay the same taxes.

The judgmental problem of applying horizontal equity cannot be ignored, since it arises in stark form in federal systems of government and is of some consequence in the design of equalization schemes.

Horizontal equity in fiscal design requires that persons equally well-off before a change be just the same after the change. In a unitary system of government, the interpretation of this is straightforward. Two persons as well-off in the absence of the government's fiscal system should be as well-off as each other afterwards (though not necessarily as well-off as they were before). Consider a federal system of government with two levels – provincial and federal. Each province could introduce a fiscal system that was horizontally equitable within its provincial boundaries. It is most unlikely, however, that the actions of individual provinces would lead to a fiscal system that was horizontally equitable nationwide; that is, two persons who reside in different provinces and are equally well-off in the absence of the provincial government fiscal systems would not likely be equally well-off afterwards. For example, the two provinces may have differing sources of natural resource wealth from which to draw tax revenues. Imagine now that the federal government wishes to institute a horizontally equitable fiscal system. It can adopt one of two views about horizontal equity. One view is that a fiscal system should be established nationwide that is horizontally equitable vis-à-vis the actions of all governments – federal and provincial. We call this the *broad* view of horizontal equity. According to this view, two persons who are equally well-off before provincial and federal government actions must also be so afterwards. To institute a federal tax system that would ensure horizontal equity in this sense, the federal government must account for the nationwide horizontal inequities introduced by the independent behaviour of the provinces and offset the fact that some persons have been made better-off in one province than their identical counterparts elsewhere. The other view – what we call the *narrow* view – is that the federal government should take as a starting point the level of real income attained by individuals after provincial fiscal systems have been established. In this case, the federal government need only be concerned with ensuring that two persons who are equally well-off after provincial government budgets are in place will be equally well-off in the presence of both provincial and federal budgets. The federal budget need not be concerned with offsetting the nationwide horizontal inequities introduced by provincial governments.

A conceptual way to view this distinction is in terms of the property rights or endowments of provincial citizens. Indeed, all applications of horizontal equity require that one stipulate an initial position against which horizontal equity comparisons can be made. If different provinces give identical citizens different net real income benefits from provincial activity and one wanted to accord full property rights to each person over such benefits, based solely on his/her province of residence, then the federal government would be better to adopt the narrow view and take as its starting point for horizontal equity the position that existed after provincial government activity. If, however, one did not wish to assign such property rights on the basis of residency, the initial position for horizontal equity purposes should be that which would have prevailed in the absence of all government fiscal activity, including that of the provinces. The distinction between these two cases will become clearer as we proceed with more specific examples of differential benefits from provincial activities. It turns out that, in general, both views call for some sort of equalization on equity grounds, but of widely differing types and amounts.

Being able to measure real income properly and accepting it as a basis for interpersonal comparisons as to *level* of welfare really only solves one of the equity problems – that of horizontal equity. The criterion for vertical equity involves being able to compare changes in real income accruing to persons with different real incomes, as well as their levels. This is what is implicitly determined by the degree of progressivity of the tax system. Our analysis does not require us to state precisely how the vertical equity criterion ought to be implemented – i.e., how real income ought to be redistributed among persons. We take it as accepted that, at the very least, society would like to have the distribution of real income more equal than it would be in the absence of intervention. This is certainly the goal advocated by the Carter Commission and is that implicitly accepted by governments, as evidenced by progressive income tax structures.[4] Thus we assume that some amount of real income should be redistributed from higher- to lower-real income persons.

The extent of redistribution desired need not be carefully specified at this point. It is something that can be determined by the political process. The distribution of real income, however, will be influenced by the actions of both the federal government and the provinces. Whose redistributive goals do we take to be paramount? This question deserves careful attention and is critical to our subsequent analysis.

Division of Powers between Federal and Provincial Levels of Government

Our analysis takes as given what we perceive to be the existing division of economic powers between the federal government and the provinces. In particular, we assume that provinces are free to set tax rates as they choose in the case of those taxes which they have the power to levy. These taxes include personal and corporate income taxes, sales and excise taxes, and property taxes,[5] as well as taxes on resources. In addition, they are assumed to have complete freedom to determine their spending on programs within their jurisdiction, such as education and health. Finally, and most critically, provinces are assumed to be able to pursue (explicitly or implicitly) their own redistributive goals within their respective jurisdictions.

This latter assumption is of fundamental importance and is somewhat at variance with analyses found in other literature with respect to the desirability of centralizing the responsibility for redistribution with the federal government. For example, Musgrave (1959) has argued in an oft-cited passage that the central government should have ultimate responsibility for income redistribution. Our view of the matter is as follows. Provincial governments do have the instruments for redistributing income in their tax and expenditure tools; furthermore, they do, to a greater or lesser extent, pursue redistributive goals. Indeed, it would be virtually impossible for provincial budget policies to be distributionally neutral no matter how the latter is defined. In principle, the federal government could attempt to override provincial redistributive policies by its choice of taxes and expenditures. To do so, however, it would have to discriminate between provinces in a particular way, and it would have to have more information than is likely to be available except at great cost. What is more, individual provinces could then attempt to undo what the federal government had done, and instability could arise if each tried to impose its redistributive goals on the same citizens. Thus it is not feasible to make either the federal government or the provinces solely responsible for redistribution; nor is it desirable. Given that each level of government has its own spending and taxing powers, each should be able to exercise them in pursuit of the redistributive goals they judge to be most desirable.

This is not to say that the existing distribution of taxing and expenditure responsibilities is the one that an economist would advocate if he were to design a constitution on purely economic principles. For example, he might well choose a purely unitary form of government. Accepting the distribution of taxing and spending powers as given, however, it could seem sensible to accept the redistributional goals that the exercise of these powers by the two independent levels of government entails.

Given that both levels of government have redistributive goals, these goals will inevitably be in conflict. If the federal government has certain views about vertical equity and the provincial governments have different views, the after-tax distribution of incomes cannot satisfy both. The amount of vertical equity achieved will end up being a compromise between the two goals. In the case of the federal income tax and transfer system, for example, a rate structure is set that reflects the federal view of vertical equity (or, more generally, its preferred trade-off between equity and efficiency). This federal rate structure is set uniformly across the nation. Individual provinces may then institute rate structures that vary from one another, and from federal norms. The end result will be a compromise between federal and provincial notions of vertical equity.

This is relevant for our discussion of equalization because, as will be seen, one of the main arguments for equalization arises out of a desire to pursue the goal of vertical equity as applied to a part of real income that is not already incorporated in the federal personal tax base. We could, if we so desired, argue in favour of an equalization scheme that would pursue vertical equity solely from the point of view of the federal government. If we did so, the federal government could completely override the redistributional objectives of the provinces.

We do not go that route. In accordance with our view that provinces are free to pursue whatever redistribution they find desirable, given their taxing and spending powers, our scheme turns out to be a compromise. Like the federal personal income tax, it has a certain property. We shall first show that the existing progressive income tax system cannot be sufficient to pursue vertical equity in a federal economic system, given the powers that the provinces are assumed to have. We shall then design an equalization scheme based on the premise that if all provinces agreed with the federal standards for vertical equity, nationwide vertical equity could be achieved. The equalization scheme is a prerequisite to this achievement. The provinces, however, may not agree to the federal norm and may wish, instead, to pursue their own intraprovincial redistribution. We do not believe that an equalization scheme should prevent them from doing this. The logic of our equalization scheme is therefore analogous to the existing federal and provincial progressive income tax and transfer schemes. They exist side by side and allow for independent provincial redistributive action. No equalization scheme other than the one we shall present will satisfy the above criterion.

The situation resembles one that is "second-best." Suppose the provinces do disagree as to redistributive goals. It is always possible, in principle, to design a scheme of equalization (different from the one we are advocating) that, given the behaviour of provincial governments, would result in a situation that is closer to the federal standard of vertical equity than ours. To do so, however, would amount to the federal government overriding the ability of provinces to redistribute. Since the federal government does not use the federal progressive tax structure to do that, there is no reason why it should use an equalization scheme to do so. The equalization scheme we advocate will be based upon exactly the same principle as is the progressivity of the federal tax structure – i.e., to make real incomes more equal. Our scheme will allow the federal notion of vertical equity to be applied nationwide provided provinces agree to the federal notion; it does not, however, compel the provinces to agree to the federal notion.

The Basic Arguments for Equalization

The federal government already redistributes real incomes through its tax, transfer, and spending policies; therefore, it is natural to ask why that should not be sufficient to enable it to reach its vertical equity objective. After all, it is the distribution of real income among persons that is relevant for vertical equity, not the distribution of income over some higher aggregate such as the province. This section presents in an intuitive way, using simple examples, the case that the federal income tax, as presently structured, is inadequate for the achievement of vertical equity. What is required, we suggest, is either a federal tax structure that discriminates explicitly between residents of different provinces, or, much better still, a program of interprovincal equalization transfers.

The problem does not arise in unitary systems of government – that is, in economies with only a single (central) level of government. In unitary states, the progressive income tax (or expenditure tax) is perfectly adequate for achieving whatever trade-off between equity and efficiency is desirable. In a federal state, with more than one level of government, the federal income tax will not suffice. The problem arises because the base of the federal income tax does not accurately reflect the real income of persons individually, since it does not fully incorporate the contribution of the lower levels of government to that income. The extent of the inadequacy will depend upon the specific assumptions that one makes about the operation of the market economy and the provincial governments. Therefore, decisions on the exact form of an ideal equalization scheme, and especially on what provincial tax bases ought to be included in it, will depend upon the economy we are analysing. Much of the following chapters will be devoted to considering the role of equalization in economies that seem to us to be fairly representative of the Canadian economy.

One of the remarkable conclusions of our analysis is that the equity and efficiency considerations coincide to a great extent; by efficiency, here, we refer to efficiency in the interregional allocation of resources. This should be apparent in the simple examples we now present. These examples are obvious simplifications of reality and are designed solely to illustrate the principles upon which subsequent, more thorough analysis is based. To begin with, we shall abstract from the redistributive activities of provincial governments by assuming that their budgets are distributionally neutral. By this is meant the following. All taxes paid by residents are used to finance provincial public services, which provide an amount of benefits to each resident equal in value to the taxes paid. Provincial public services are all taken to be "private" in nature (rather than public goods). Thus if an individual pays x dollars in taxes, he receives x dollars of provincially provided goods and services on that account. If the province obtains revenue from other sources (e.g., from commonly owned resources or foreigners), it is used to provide equal per capita benefits to residents. The consequences of provincial redistributive activity will be discussed subsequently.

The Equity Argument

Some Models of Distributionally Neutral Provincial Governments

We begin with an example of a federal economy in which no equalization is needed for equity and in which equalization would detract from the federal goal of vertical equity. Suppose the federation has two provinces, *A* and *B*, and each of these provinces is populated by persons who are homogeneous (i.e., the same) within provinces and immobile between them. This model effectively abstracts from intraprovincial redistribution by making all residents in a province identical. Suppose further that there are the same number of persons in each province. Annual wages are $20,000 in *A* and $10,000 in *B*, and these are the only sources of income. Table 2-1 shows the per capita incomes of individuals in *A* and *B* before and after federal taxation and transfers.

Table 2-1

Net Per Capita Income in Two Hypothetical Provinces after Federal Taxation and Transfers

	Province *A*	Province *B*
Gross income	20,000	10,000
Net income after federal taxation and transfers	18,000	12,000

The federal government has taken $2,000 in taxes from each person in *A* and given it to persons in *B* via its income tax, in pursuit of vertical equity. It has not fully equalized income because it wants to avoid disincentive effects or because it has taken a value judgment not to do so. If there were no provincial government taxes and spending, the federal goal of vertical equity, whatever it might be precisely, would be completely attainable by taxes and transfers at the individual level as in Table 2-1. There would be no need for intergovernmental transfers as well.

Suppose now that provincial governments decide to take over from the private sector the provision of one or more of the private goods being produced – e.g., health or education. The good is taken to be a completely private good and is financed by a tax on wage income. If the provincial government provides exactly the same quantity of the good as the private sector had provided, then nothing has changed and there is still no need for equalizing transfers among governments.

Provincial governments may, of course, decide to provide a different amount than would have been provided privately; however, as long as they finance it with a tax on the residents themselves, the "opportunity" cost of providing the same amount has not changed. In other words, the real income base from which goods and services have been purchased has not changed; it is still the $20,000 and $10,000 that enter into the federal tax base. That the provinces have chosen to provide an amount other than that which persons would buy in a free market is not relevant to the policy of the federal government. It is a legitimate exercise of spending power by the provinces and need not be "corrected" by federal action; however, should correction be desired, the more appropriate means would be federal conditional grants or federal programs *per se*.

It should be emphasized that the above arguments assume that provinces are providing private goods. As will be discussed later, if they provide goods of a public nature (or goods with increasing returns to scale), this can cause differences in real income opportunities to arise across provinces in a manner that is not reflected in the federal tax base.

In order to make equalization payments desirable, we must allow for the possibility that the actions of provincial governments influence the real income opportunities of persons in a manner that is not reflected in the federal income tax base. Let us retain our assumption of homogeneous persons within the province but allow for the possibility that provinces may levy a tax on a base that is not part of the observed income entering the federal tax base.

The simplest case to think of is that of resource rents. Suppose that in our two-province economy income takes the form of both wage income and property income, where the latter may include rents generated from the ownership of resource properties. Suppose that province *A* levies a tax of $2,000 per capita on rents at source within its jurisdiction. If these properties are foreign-owned, this represents an additional source of income to the province. If the properties are owned by residents, the property income of residents and thus the federal tax base would fall by $2,000 (unlike when provinces tax income, as they did earlier). In either case the federal income tax base will not adequately reflect the real income available to residents, which they can spend on private goods or have spent on their behalf by the provinces. Table 2-2 illustrates this point.

Table 2-2

Net Per Capita Income in Two Hypothetical Provinces after Federal and Provincial Taxation

	Province *A*	Province *B*
Gross income	20,000	10,000
Net income after federal tax	18,000	12,000
Rents taxed by province	2,000	0
Net income after federal and provincial taxation	20,000	12,000

In Table 2-2 the federal tax bases are identical to those in Table 2-1. The per capita after-tax income, as measured by the federal tax base, appears to be the same as in Table 2-1; however, real income in province *A* is greater than $18,000. Now there is $2,000 in provincial tax revenues that is not accounted for in the observed income. It could, for example, be used to reduce provincial income taxes in *A* and thus release $2,000 more for private consumption. The net incomes of $20,000 in *A* and $12,000 in *B* will not correspond with the federal government's view of vertical equity, as reflected in the $18,000 and $12,000 figures. Province *A*'s citizens will be "too well-off."

In principle, there are a number of ways to correct the situation so that the federal government's notion of vertical equity will be applied to the appropriate measure of real income. The problem facing the federal government is to design a progressive tax system that corresponds with its view of vertical equity and that is consistent with horizontal equity. As noted, there are two possible interpretations of horizontal equity in a federal system of government.

We shall present two methods of incorporating the unaccounted-for sources of real income into federal redistribution policies, each case corresponding to one of the two views of horizontal equity discussed above.

According to the broad view of horizontal equity, two persons equally well-off before both provincial and federal government activity ought to be equally well-off afterwards. In the case where one province (*A*) gets tax revenues from rents in the province while the other does not, the original situation against which horizontal equity is applied is the income level before provincial taxation of rents. Thus if two persons have incomes of $20,000 in different provinces, exclusive of the activities of their provincial governments, they ought to be equally well-off after the activities of provincial and federal governments. Now, suppose that rent-generating properties are foreign-owned so that their taxation represents an additional source of real income to the province. Since per capita resource rents of, say, $2,000 are being obtained in province *A*, while none are being captured in *B*, the federal tax structure can only be horizontally equitable in the broad sense if the per capita resource rents are fully equalized. In this case, $1,000 per capita is taken from province *A* and given to province *B*.[6] Then, and only then, could two persons with gross incomes of $20,000 in the absence of activity by all governments end up with the same real incomes after federal and provincial government activity if the federal government applied its income tax nationwide to observed incomes.

The alternative narrow view of horizontal equity requires only that two persons equally well-off after provincial government activity remain equally well-off after federal government activity as well. If residents in *A* obtain $2,000 per capita from rent taxes, a person with $20,000 gross income in the presence of provincial activity will have a real income of $22,000, inclusive of provincial government activity. In order for federal horizontal equity to be achieved, it would be necessary for that person to pay the same federal taxes as a person earning a gross income of $22,000 in a province where no resource rents are generated (*B*). This can be achieved by a redistributive scheme that is equivalent to including the $2,000 imputed real income from rent taxes in the taxable income of residents of province *A*. If intergovernmental transfers are used, horizontal equity in this sense can be achieved as follows. Suppose the federal marginal income tax rate is roughly constant at 30 per cent. Then the person with $22,000 income in *B* is paying (0.3 x $2,000) $600 more in taxes than his counterpart in *A*, whose taxable income underestimates real income by $2,000. Narrow horizontal equity would require equalizing this $600 (by transferring $300 per capita from province *A* to province *B*) instead of the full $2,000. Such a scheme is equivalent to subjecting the $2,000 in rental income to federal taxation.

These conclusions may have to be amended slightly if some of the resources that are generating rents are owned by residents of the province rather than by foreigners. For example, suppose that the resources are fully owned by residents on an equal basis. If the province collects taxes on rent, using a tax at source, then the observed property income of residents will decline by the amount of tax revenues collected. Thus a person with $20,000 income would have had $22,000 of income before provincial rent taxes, and that would be his original real income for the purpose of horizontal equity. Adopting the broad view of horizontal equity, he should be equally as well-off after provincial and federal taxes as a person earning $22,000 in the other province. Since he pays $600 less in federal taxes, only $300 need be redistributed from *A* to *B*. Similarly, if one-half of the rents are from foreign-owned resources while the other half are from local residents' property, half the resource rents ought to be fully equalized, while 30 per cent of the remainder ought to be equalized.

These restrictions on the redistribution of provincial taxes on resource rent under the first view of horizontal equity will be influenced by two considerations. First, the resource properties may be owned by Canadian residents of other provinces instead of foreigners. This strengthens the case for redistributing the resource rents. Second, even if they are owned by residents of the province, they may be highly concentrated in a few hands rather than being widely held. In this case, the windfall accruing to residents through the provincial budget comes at the expense of the individual resource owners. Broad horizontal equity would require, in addition to equalization, the identification of those resource owners, so that they might receive an appropriate transfer. That is unlikely to be feasible. The foregoing considerations pertaining to who owns the properties from which resource rents are generated will only influence equalization under the broad view of horizontal equity. Under the narrow view, the original position is taken to be the one that exists after the rents have been confiscated.

Thus, depending on one's view of horizontal equity (or ownership of rents, in this example), the federal government should either equalize the differences in resource rent taxes fully or equalize *x* per cent of the differences in resource rents, where *x* is the federal income tax rate. But the equalization should be based only on the rental tax revenues collected by provincial governments. It should not be applied to the differences in per capita provincial income tax collections, since they do not disrupt the ability of the federal government to pursue vertical equity, using its progressive income tax, when provinces are distributionally neutral. Nor should it be applied to differences in tax *bases*. It is the actual rental income collected by the provinces that should be fully or partially equalized, not total provincial rents *per se*. This same point applies to the other types of provincial tax collections to be equalized, as will be discussed later on. For example, it may well be the case that province *B* actually has higher rents but is not taxing them.

The fact that actual rent collections ought, in principle, to be equalized is going to turn out to be a problem from a policy point of view. If such rents were to be completely equalized, the incentive for provinces to collect them would disappear. This may not be desirable for two reasons. First, taxing rents may be a relatively efficient way for provinces to collect revenues. Second, since we are taking as given the legitimacy of provincial rent taxes on constitutional grounds, we might not wish to set up an equalization scheme that would effectively remove the benefit to a province from taxing resource rents. The fact that we do not wish to interfere with the incentive of provinces to levy rent taxes (and other taxes that enter into the equalization payments) means that the equalization scheme cannot be ideal in the sense that it cannot fully equalize differences in tax collections. To use the terminology of the fiscal federalism literature, the equalization scheme cannot be directly related to *tax effort*.[7] In order to avoid this disincentive effect, we shall end up having to incorporate some measure of tax capacity rather than actual tax collections into an equalization scheme. That seems unavoidable given the constitutional objectives that we are taking as given.

In the example given above, equalization would effectively go from the high-income region (*A*) to the low-income region (*B*). In principle, it is not inconceivable that it could go from *B* to *A*. If the $2,000 of rental income accrued to province *B* rather than province *A*, that would be the case (Newfoundland vs. Ontario, for example?). In effect, the federal income tax system is overdistributing from *A* to *B*, since it is not including in *B*'s taxable income the real income attributable to the rents collected by province *B*.

The upshot of this discussion of equalization in the presence of provinces that collect taxes on resource rents but behave in a distributionally neutral fashion is that some equalization of the resource rents is desirable on equity grounds. If one adopts as a basis for judging the horizontal equity of provincial government actions the real incomes of individual persons before the actions of provincial and federal governments (the broad view), nationwide horizontal equity would call for full equalization over the provinces of resource rents collected (except to the extent that the economic incidence of those resource rent taxes was on the residents of the taxing province). Alternatively, if horizontal equity in federal fiscal design is judged with respect to real incomes after provincial government activity (the narrow view), horizontal equity calls for *x* per cent of resource rents to be equalized, where *x* is the federal income tax rate. This latter view ignores the fact that provincial government activity itself violates nationwide horizontal equity vis-à-vis the no-government initial position. As well, it enables the provinces to continually change the initial position against which federal horizontal equity is judged, as will happen whenever provinces change their budgets. On the other hand, this latter view of horizontal equity may be taken to correspond to the view that residents of a province really should be considered the proper "owners" of resource rents. In subsequent chapters these arguments will be extended to include other types of taxes levied at source, such as the corporate income tax.

Redistributive Provincial Government Budgets

These examples have ignored the complications that arise when provinces, in addition, carry out redistributional policies of their own. To analyse such a case we require persons of different income groups within each province. Let us consider a simple example. Extending our previous examples, let us suppose there are some earning $20,000 and some earning $10,000 in both regions. In *A* there are twice as many high-income as low-income people, while in *B* there are twice as many low-income as high-income people. Both regions, however, have the same population, so that over the nation as a whole there are the same number of each type of person. Table 2-3 illustrates this case.

Table 2-3

Net Income of High-Income and Low-Income Persons in Two Hypothetical Provinces after Federal Taxation

	Income (*Y*)	Province *A*	Province *B*
Gross income	High *Y*	20,000	20,000
	Low *Y*	10,000	10,000
Net income after federal tax	High *Y*	18,000	18,000
	Low *Y*	12,000	12,000

Suppose first that there are no provincial governments so that the state is a unitary one. From the point of view of national equity, the personal income tax system is sufficient to pursue federal redistributive goals. In the example, the tax system takes $2,000 from high-income persons and gives that amount to low-income persons, there being the same number of each nationwide. The fact that they are now mixed over the regions is of no consequence. In the absence of provincial taxes and spending, there is obviously no need for equalization.

Now imagine that the provincial governments take on the provision of some private goods that were previously allocated by markets. If their tax collections and spending patterns exactly replicated the market outcome, the situation would be no different from above, and there would be no need for equalization. More generally, even if they did not replicate the market solution, provided they were distributionally neutral in their taxing of residents and provision of public services, there would be no need for equalization. Distributional neutrality in this context means that each resident is paying in taxes an amount equal to the value of quasi-private goods received from the provincial government, regardless of what that might be.[8]

It should also be apparent that the need for equalization would arise here if the provincial governments had available a source of tax revenues that was incident upon nonresidents. The example of Table 2-2 continues to apply here in the case where persons are heterogeneous within provinces. Suppose that province *A* has taxes on rental income from foreign-owned property amounting to $2,000 per capita. This is a source of real income that is not captured in the federal tax base. It would be desirable to equalize this source of provincial tax revenue, the extent of equalization depending upon one's view of horizontal equity. If one wanted persons who were equal before provincial and federal government activity to be equal afterwards, full equalization would be required. If, on the other hand, the federal government only desired that persons who were equal after provincial government activity also be equal after provincial and federal activity, the amount to be equalized would be the federal income tax rate times the amount of tax revenue collected on rents.

Suppose now that provinces are not distributionally neutral in their taxing and expenditure policies with respect to residents. In order to analyse this case, it is necessary to be explicit about the redistributive nature of provincial government budgeting. A convenient case to take, and one that will figure prominently in the analysis of future chapters, is as follows. Assume that provincial taxes on residents (both income taxes and indirect taxes) are incident in proportion to income. On the spending side, suppose that quasi-private goods (e.g., education and health) are provided on a uniform per capita basis. This combination of proportional taxation and equal per capita benefits makes the fiscal system progressive in the sense that the net benefit of provincial government activity falls with income. We shall simply ignore public services financed out of nonresidence-based taxation. Provided they yield equal per capita benefits, the case for equalizing them will not be affected by progressivity in the remainder of the budget; nor will their presence affect the arguments of this section regarding the equalization of residence-based taxes.

To make the example specific, assume that each province levies a 10 per cent income tax on its residents and uses the proceeds to finance equal per capita benefits for its own residents. Persons in a given income group will pay the same taxes regardless of where they reside (10 per cent), but they will receive different levels of benefits. In the example shown in Table 2-3, a 10 per cent tax on all incomes in province *A* will finance a level of per capita benefits of $1,667. Low-income persons receive a net fiscal benefit (NFB) of $667 (1,667 – 1,000) from the provincial government, while high-income persons receive an NFB of –$333. In province *B*, where there are twice as many low-income as high-income persons, per capita provincial expenditures would be $1,333. This would correspond to an NFB of $333 for low-income persons and –$667 for high-income persons. The important point to notice is that for each income group there will be a difference in NFB of $334, it being higher in the high-income province.[9]

Consider now the design of an equitable system of redistribution at the federal level. Two problems exist. The first is that the nominal measure of income used as the federal income tax base will fail to be an accurate index of real income, since it does not reflect the NFB's received by persons from their own province. Second, related to the first point is the fact that the NFB's vary systematically over provinces. They are $334 higher for persons of all income classes in *A* than in *B*; this implies that, from a national point of view, the combined actions of the provinces are horizontally inequitable. The issue to be determined is whether equalization payments have a role to play in the redistributive arsenal of the federal government. Not surprisingly, that depends upon the view that one takes of horizontal equity – i.e., what the federal government regards as being the initial position from which to judge the equity of the fiscal system. We shall consider the broad and narrow views of equity in turn.

The federal government may take the view that national horizontal equity requires that the combined effects of provincial and federal budgets must be such that two persons equally well-off in the absence of all governments must remain equally well-off in their presence. This would require that, say, the persons earning $20,000 in *A* and *B* have the same real incomes after federal and provincial government activities. Clearly, the operation of provincial governments alone violates broad horizontal equity, since all persons in *A* are better-off by $334 than all persons in *B*. The obvious way to remedy this situation would be to equalize fully this $334 per capita difference by transferring $167 per capita from *A* to *B*. Notice that, in this case, the transfer of $167 per capita effectively equalizes fully the differences in income tax collections in the two provinces. Once the transfer is made, each province can provide the same level of public services for the same tax rate to all citizens (just as a unitary state would do). The federal income tax system, even if it is based on nominal income only, will then be horizontally equitable, since all persons in a given income group will have the same NFB regardless of where they reside. Although the federal tax base still differs from real incomes, that is something which can adequately be dealt with by varying the rate structure uniformly across the nation, since all interprovincial biases have been removed. Thus the same broad notion of horizontal equity that called for full equalization of provincial nonresidence taxes also calls for full equalization of taxes collected from residents.

The alternative narrow view of horizontal equity that the federal government might take is that the actions of provincial governments should be taken as given in a federal system of government, and the federal government should ensure that its fiscal actions treat persons identically who are identical after provincial budgets are in place. This goal can only be completely attained by effectively having the full amount of real incomes (nominal incomes plus NFB) enter the federal tax base. It can easily be seen that intergovernmental transfers cannot contribute to this goal. Consider the residents of province *A*. Those in the low-income group are receiving an NFB of $667, which is not being included in taxable income. They are thus being "undertaxed" by $667*x*, where *x* is the federal tax rate. The high-income persons likewise are receiving an NFB of –$333 and are being "overtaxed" by $333*x* at the federal level (assuming the same marginal federal tax rate *x*). Since there are twice as many high-income as low-income persons in province *A*, the net amount of tax overpayment by residents in *A* is zero, on aggregate. The same holds for province *B*, so that no interprovincial redistribution will contribute to the solution in this case (of course, if the federal marginal tax rate rises with income, one can argue for a small amount of redistribution by provinces; this is discussed in later chapters). Federal horizontal equity is still not achieved under the federal income tax system, since the NFB's are not being included in taxable income. Equalization of the NFB's will only make matters worse however, since, in this view of horizontal equity, the NFB obtained from residence in a province is treated as a legitimate income "endowment" for the purposes of federal redistribution.

These examples are only illustrative of the general principles of equity and their implications for equalization, since they depend very much upon the particulars of the example. Nonetheless they do provide a useful bench-mark for future chapters. In the example given here, we found that, depending upon one's view of horizontal equity, one might either opt for full equalization of all tax revenues at the provincial level or for equalization of *x* per cent of the nonresidence tax revenues only. In subsequent chapters, we shall explore the implications of alternative assumptions about the redistributive activities of provincial governments.

The above example is interesting because it reflects what is sometimes referred to as the "minimum-standards" argument for equalization. That argument states that equalization should enable all provinces to provide the same level of public services at the same tax rates to all residents; here, the tax rate is the provincial income tax rate. As the example indicates, the case for equalizing tax revenues fully can be interpreted as a minimum-standards argument. It can be justified under the special circumstances in which the provincial budget is progressive in the manner stated, and provided one accepts the view that horizontal equity should apply to all government activities with respect to the no-government real income levels. The minimum-standards argument will gain further support once efficiency considerations are taken into account.

The Efficiency Argument

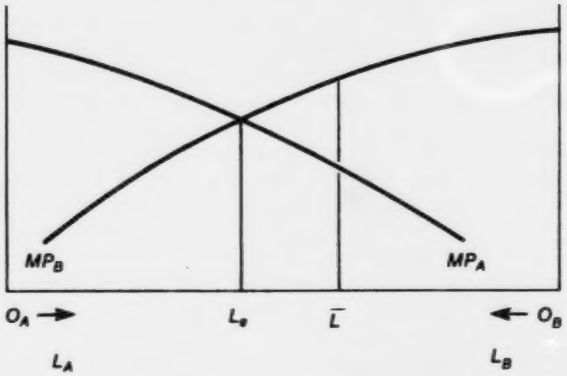
So far we have simply ignored the fact that equalization might induce a reallocation of resources over provinces. There might therefore be expected to be efficiency consequences from adopting any scheme that influences real incomes according to province of residence. Indeed, one of the main arguments against the present equalization scheme, as noted in Chapter 1, is precisely that it interferes with resource allocation, in particular with respect to the migration decisions of individual persons. The analysis of this study will show that, although the present system undoubtedly does lead to such inefficiencies, a fairly extensive scheme of equalization will be called for on efficiency grounds, and that scheme will accord closely with that satisfying the broad view of horizontal equity.

The efficiency of ideal equalization schemes can be easily shown, using a simple model analogous to those used above. The point is a familiar one and has been made often in the context of the inefficiency of migration in the presence of resource rents.[10] Consider a simple case in which all persons are identical, and their income comprises wage income and property income. Wage income is obtained only from the province of residence, whereas property income is obtained from ownership of property and is independent of province of residence (before tax). In the absence of provincial government activity, migration only influences wage income received (after federal taxes and expenditures, which we take to be uniform over the nation). Assuming costless migration, workers will therefore migrate until wages are equalized over regions. Under competitive conditions, this implies that marginal products are equalized over regions, and efficiency of interprovincial labour allocation is ensured.

This is shown by the allocation L_e in Figure 2-1. This diagram depicts the marginal value products (MP_A, MP_B) in A and B for various allocations of a fixed labour supply (L_A, L_B). The equilibrium L_e is at the point of intersection of these two curves. The equilibrium allocation corresponds to the efficient allocation of labour over the two regions.

Figure 2-1

Equilibrium Allocation of Labour in Two Hypothetical Provinces



Now introduce provincial governments into A and B. If these governments merely tax residents on, say, their income and use that income to provide private goods that would otherwise have been provided by the market, nothing has changed. The equilibrium allocation of labour is still L_e since real incomes have not changed. No equity or efficiency case exists for equalization. Of course, in these circumstances if some equalization payments were made from one region to the other, efficiency would then be destroyed.

Suppose now that, say, province A levies a tax on rents and uses the proceeds either to displace income taxes on residents or to provide additional public services. There will now be a net advantage to residing in A, simply to capture one's share of the provincial public services financed out of the rents. Labour will migrate to A until a wage differential is created large enough to compensate for the net benefits of the provincially collected tax on rents. Labour will now be misallocated, since $MP_A < MP_B$; thus the provincial rents will have induced an inefficiency into the system. This inefficiency can be eliminated by an ideal scheme that equalizes resource rent collections over provinces – exactly the same measure that is called for on broad equity grounds.

Of course, similar sorts of implementation problems arise here. Full equalization will not be possible owing to the incentive effects that they have on provincial governments. Also, a certain amount of inefficiency will be inevitable if we are to abide by our assumption that provinces should be allowed to pursue independent tax and expenditure policies. For example, provinces may decide on different tax rates on capital, and this will upset efficiency in its allocation. Nonetheless, as far as taxes on rents or other source-based taxes are concerned, efficiency in the allocation of resources will call for full equalization. This is consistent with the prescription called for on grounds of horizontal equity vis-à-vis the no-government position.

Suppose that provincial governments also engage in some redistribution via their residence-based taxation and expenditures. One might think of the case of proportional taxation on equal per capita benefits. This intraprovincial redistribution gives rise to NFB's that differ systematically over provinces, being higher in high-average-income provinces than in low. As will be discussed fully in Chapter 5, marginal products of labour for a given income group will not be equated over provinces, since workers also respond to differences in NFB's when migrating. From an efficiency point of view, given free migration, the NFB's should be equalized. Thus, in this particular regime of things, efficiency calls for full equalization of all provincial tax revenues. Efficiency and equity are fully compatible when equity is interpreted as including the effects of both federal and provincial government actions. If the redistributive actions of provinces differ from those assumed here, the exact type of equalization will change, but efficiency and equity (in the sense discussed) will continue to hold simultaneously.

One caveat ought to be pointed out as far as the foregoing analysis is concerned. We have taken for granted that the flow of rent tax revenues and NFB's yield benefits to residents as they accrue. Since these benefits depend upon residency, however, it is possible in principle that they could be capitalized into land values and accrue to the class of landowners who held land at the time the future benefits of the provincial government actions were perceived. Such capitalization can occur if land for residency is scarce and in inelastic demand by residents. To the extent that capitalization does occur, one can argue that equalization is not necessary on efficiency (or equity) grounds, since the fiscal benefits of residency are accruing to landowners rather than to migrants and residents at large. On the other hand, equalization may do no harm, since it will presumably be capitalized to the same extent as well. A much fuller analysis of the effects of capitalization than we have been able to conduct would clearly be desirable. Since land is generally not scarce relative to the number of migrants, however, it is unlikely that the extent of capitalization is such as to negate the above arguments for equalization.[11]

In subsequent chapters we shall flesh out these simple arguments, using more formal models, and shall examine the implications of a number of alternative assumptions about the way in which the economy operates. In particular, we shall analyse exactly what sorts of taxes ought to be included in an equalization formula. An important distinction will be drawn in the subsequent analysis between residence-based and source-based taxes. It turns out that the desired amount of equalization of these two types of taxes will depend upon the amount that the provinces are deemed to be redistributing already and upon one's preferred view of horizontal equity. The latter will not be independent of one's interpretation of the federal Constitution.

3 Equity and Efficiency Arguments for the Equalization of Source-Based Taxation

As indicated already, the case for equalization payments rests on the existence of differences in the real income of individuals as a result of the activities of provincial governments. More precisely, the equity argument arises from interprovincial differences in net fiscal benefits; these differences are not captured in the base of the regular tax/transfer system (i.e., personal market incomes). The efficiency case rests on the distorting effects of these same differences in net fiscal benefits on interprovincial resource allocation decisions. The purpose of this chapter is to present the basic analytical arguments for equalization in the special case where provincial budgets are distributionally neutral. We are about to develop the equity arguments for equalization and then we shall turn to efficiency.

Equity Arguments for Equalization

The goal of equity is concerned with the relative level of economic well-being among persons individually. On the other hand, equalization is a scheme for redistributing purchasing power among *provincial governments*. It is natural to wonder why equity cannot be achieved solely through transfers to persons individually rather than through increased transfers to provincial governments. In order for equalization to be appropriate, the equity objective must call for discrimination in the tax treatment of persons based on place of residence *per se*. Our analysis begins by showing why, in a federal system of government, two persons who are otherwise identical should be treated differently for tax purposes if they reside in different provinces. The reason arises from differences in net benefits that are received from the operation of provincial governments. Having determined that province of residence is an appropriate determining factor for tax treatment, we then argue that interprovincial transfers may be an appropriate way to incorporate these differences between provinces into federal policy.

Before turning to the analysis, we shall specify more carefully the nature of the equity criterion that is being used here, since it involves a value judgment about redistribution. Equity is used here in the vertical and horizontal sense of public finance as enunciated fully, for example, in the Carter Report (1966). Following the recommendations of the latter, we take the view that an appropriate index of equity is real income, defined in as comprehensive a way as is practicable, and that one of the aims of government should be to make the distribution of real income among persons more equal (vertical equity). This goal is apparently widely accepted and is incorporated into the existing progressive income tax and transfer schemes. Full equality of real incomes is undesirable because of the presumed disincentive effects of high marginal tax rates; however, some redistribution is desired. Horizontal equity requires that persons with identical real incomes receive similar treatment under government budgets. We begin by indicating how real incomes are influenced by the operation of provincial governments in a federal system.

The main argument can be seen most clearly, using a stylized view of the economic system that incorporates a number of simplifying assumptions. The consequences of relaxing these assumptions will be discussed subsequently. In order to concentrate solely on equity issues, it is assumed that labour is completely immobile between provinces. It could be mobile within the province, and it could be subject to variable supply; neither of these factors would be of any consequence for equalization arguments. Production and, thus, income are assumed to be generated from three primary factors of production: labour, capital, and land. Land may be thought of as a composite resource, incorporating not just land but also natural resources and anything else that would make production more efficient in one location than in another. Land will be viewed throughout this analysis as something in fixed supply and immobile between provinces. On the other hand, capital could be mobile between regions, and its mobility would be of some consequence to the efficiency arguments below.

Persons obtain income from the labour they supply, as well as from the capital and land they might own in any province. For simplicity, we restrict ourselves to the case of a two-province federation, although this has no bearing on the results. Provinces levy a variety of taxes. To begin with, we incorporate three kinds of taxes: a proportional income tax, a tax on capital income, and a tax on land rents. The last two are levied at the source on all capital and land within the province,[1] while the income tax is levied on the resident's income regardless of where it is earned. Consequently, we refer to capital and land taxes as "source-based" taxes and to income tax as a "residence-based" tax. Commodity and sales taxes are ignored for the time being.

Each province uses all of its tax revenues to provide public services for its own residents. In principle, these public services could range from pure public goods to pure private goods. In the case of the former, each citizen benefits from all the expenditures of the province; in that of the latter, a citizen benefits only from the self-directed expenditures. We shall assume that all provincial public expenditures are of a private nature. This is probably not too far from the truth for the main provincial expenditure items: health, education, and welfare.[2] This being the case, the real income benefits of provincial public expenditures for a person are taken to be the value of the publicly provided private goods consumed.

Let us now write down an expression for the real income of individual persons, taking into account the operation of the provincial public sector. In so doing, we assume that price levels are identical for the two provinces. Real income will consist of income from labour, capital, and land after taxes, plus the equivalent of provincial expenditures consumed by that person. We assume throughout this chapter that all persons in a province are identical. This permits us to present the analysis in terms of the representative person in any province. In Chapter 5 we shall relax this assumption. The results of the analysis will remain unchanged so long as provincial governments are distributionally neutral in their fiscal activities; the introduction of non-neutral provincial budgets provides some interesting new conclusions, which will be discussed in Chapter 5.

The real income of any resident of province *A*, after provincial taxes and expenditures, will be:

$$\begin{aligned} Y_a = {} & W_a (1 - t_Y^a) \\ & + (1 - t_Y^a) \left\{ \theta_a [r_a (1 - t_K^a) K_a + r_b (1 - t_K^b) K_b] + \sigma_{aa} s_a (1 - t_N^a) N_a + \sigma_{ab} s_b (1 - t_N^b) N_b \right\} \\ & + P_a / L_a, \end{aligned} \tag{3.1}$$

where W_a, r_a, and s_a are the factor payments for labour, capital, and land, respectively, in *A*, and, similarly for province *B*; t_Y^a is the provincial personal income tax rate; t_K^a and t_K^b are capital tax rates levied at source by provinces *A* and *B*; t_N^a and t_N^b are the land tax rates; L_a, K_a, and N_a are the equilibrium quantities of labour, capital, and land; θ_a is the share of the nation's capital stock owned by each resident in *A*; σ_{aa} and σ_{ab} are the resident's shares of land ownership in *A* and *B*, respectively; and P_a are the total provincial expenditures in *A* for residents of that province. The first and second lines in equation 3.1 represent this citizen's net-of-provincial-tax income from labour and property (capital and land), respectively. The third line represents his/her share of the benefits from provincial government expenditures. Now, if we assume that the provincial government has a balanced budget; i.e.,

$$\begin{aligned} P_a / L_a = {} & t_Y^a \left\{ W_a + \theta_a [r_a (1 - t_K^a) K_a + r_b (1 - t_K^b) K_b] + [\sigma_{aa} s_a (1 - t_N^a) N_a + \sigma_{ab} s_b (1 - t_N^b) N_b] \right\} \\ & + t_K^a r_a K_a / L_a + t_N^a s_a N_a / L_a, \end{aligned} \tag{3.2}$$

then equation 3.1 can be rewritten as follows:

$$\begin{aligned} Y_a = {} & W_a (1 - t_Y^a) \\ & + (1 - t_Y^a) \left\{ \theta_a [r_a (1 - t_K^a) K_a + r_b (1 - t_K^b) K_b] + \sigma_{aa} s_a (1 - t_N^a) N_a + \sigma_{ab} s_b (1 - t_N^b) N_b \right\} \\ & + t_Y^a \left\{ W_a + \theta_a [r_a (1 - t_K^a) K_a + r_b (1 - t_K^b) K_b] + [\sigma_{aa} s_a (1 - t_N^a) N_a + \sigma_{ab} s_b (1 - t_N^b) N_b] \right\} \\ & + t_K^a r_a K_a / L_a + t_N^a s_a N_a / L_a. \end{aligned} \tag{3.3}$$

This is the same as equation 3.1 except for the third and fourth lines, which represent the resident's consumption of provincial public services. The third line is the amount financed from (residence-based) personal income taxes; the fourth line is the amount financed from source-based provincial tax revenues.

After some simplification, this expression for the real income of a resident in province *A* becomes:

$$\begin{aligned} Y_a = {} & W_a + \theta_a [r_a (1 - t_K^a) K_a + r_b (1 - t_K^b) K_b] \\ & + \sigma_{aa} s_a (1 - t_N^a) N_a + \sigma_{ab} s_b (1 - t_N^b) N_b \\ & + t_K^a r_a K_a / L_a + t_N^a s_a N_a / L_a. \end{aligned} \tag{3.4}$$

Under the same assumptions, a similar expression would hold for any citizen in province *B*. This expression consists of wage, capital, and rental income per capita before provincial income tax (the first two lines) plus per capita tax revenues from source-based capital and land rent taxes (the last line). The terms involving personal income taxes have cancelled out since the province's tax take from residents just offsets a corresponding amount of per capita provincial expenditures. The use of personal income taxation by provincial governments to provide quasi-private goods is analogous to private expenditures by the citizens themselves out of their own incomes. No net addition to the real income of the citizen is obtained by virtue of its passing through the provincial public sector.[3]

Consider now the vertical equity goal in light of this expression for real income. The policy objective should be to bring the real incomes of individuals closer to equality, and the primary tool for doing so is the progressive personal income tax. The base of the personal income tax, however, is income from wages, capital, and land (before personal income tax but after source-based taxes) – in equation 3.4, the first two lines on the right-hand side. The personal income tax would therefore be adequate to reduce the inequality in real income that arises from differences in wage payments or property income. It does not, as presently constituted, erase those differences in real income which stem from the citizen's share of the revenues generated by source-based taxes. These are legitimate sources of the differences in real income between individuals, as the above analysis shows.

In similar fashion, these interprovincial differences in source-based tax revenue per capita prevent the attainment of horizontal equity under the standard tax/transfer system. Under this system persons with identical personal market income will pay the same federal taxes, even though their real income, including net provincial fiscal benefits, may be quite different. Similarly, persons with identical real income in different provinces will have different personal market income and hence will be treated differently under the personal-income-based tax/transfer system.

There are two general approaches to solving the equity problems caused by differences in net provincial fiscal benefits, and we shall deal with each of them in turn. The first, and possibly most obvious, solution would be simply to eliminate all differences in such net fiscal benefits. To accomplish this, two methods come to mind: 1/ through transfers to persons individually; or 2/ through transfers. to provincial governments. If the federal government wished to make the transfers directly to individuals, it could do so through the machinery of the existing personal income tax; however, that tax would then no longer be uniform over provinces. The citizens of the province with the lower source-based tax revenue per capita would pay less federal income tax; the opposite would apply to the other province. Presumably the progressivity of the marginal rate structure on other income would not be affected, so that the differences could be incorporated via a lump-sum component that would vary over provinces (i.e., by tax credits rather than deductions).

The alternative method for eliminating differences in net fiscal benefits would be to redistribute funds from provinces with high to those with low source-based tax revenues per capita. In this case it would be left to the provincial governments to use them as they saw fit. The federal personal income tax in this case would remain completely uniform. In principle, there is no real economic difference between making the grants to the provinces or making them directly to persons individually. In either case the federal government needs to know how much revenue is collected by the provinces and must decide how much of it should be redistributed.

Suppose we accept the principle of solving the problems of horizontal and vertical equity that arise from interprovincial differences in net fiscal benefits by eliminating all such differences – by pursuing full equalization of per capita source-based tax revenues across provinces. What incentive problems might be created by such a scheme? First, with no mobility of labour, as we have assumed so far, there would be no incentive for migration.[4] When we look at the behaviour of provincial governments, however, we see that real differences do arise with full equalization. Such a measure would effectively impose a 100 per cent tax on the marginal revenues collected by high-revenue provinces and give a 100 per cent subsidy to low-revenue provinces. This would remove virtually all incentive for provinces to collect revenues through source-based taxes on rent and capital income. Any scheme that would make the reallocation of funds depend closely upon the tax efforts of the provinces would have that effect. Not only would that be undesirable in itself, it would also be viewed as a complete overriding of provincial taxing priorities. (This problem would be exacerbated if we broadened our perspective to consider individuals other than the representative one below.)

There are a couple of ways out of this problem.[5] One would be to equalize not the *actual* but the *potential* revenues collected per capita. Such a scheme would probably be rather difficult to administer, since it would require knowing the potential tax bases for the provinces. As well, it would not be particularly equitable, since the equalization payments would be made regardless of whether provinces were exploiting the tax bases concerned. Indeed, the choice of which potential tax bases to equalize would in itself be difficult once other tax bases were admitted in addition to those we are considering here.

The alternative would be to forgo complete revenue equalization and to devise a scheme that would not make the equalization entitlement directly dependent upon the tax effort of the province involved. The obvious candidate for this would be a reallocation formula like the present equalization formula except that it would be applied only to the source-based tax revenues gathered by the provinces.[6] In other words, a set of national-average source-based tax rates could be devised, as well as national-average tax bases. The equalization entitlement could then be calculated by applying the national-average tax rates to the actual provincial tax bases and comparing that with the same rates applied to the national-average tax bases. Entitlements could be either positive or negative and could be granted to governments or on an equivalent basis to individuals. Provided that provinces did not behave too differently, the end result would be almost the same as if actual revenues were fully equalized.

In short, the equalization grant per capita could be calculated as it is now, except for two things. First, the taxes to be equalized might be different: under the assumptions we have made so far, the income tax would not be equalized; source-based taxes would. Second, both upward and downward equalization should be pursued; i.e., the scheme should "net" rather than "gross."

Recall now that elimination of the interprovincial differences in real income caused by net provincial fiscal benefits is just one possible approach to the equity problems to which they give rise. It corresponds with the broad view of horizontal equity, aimed at ensuring horizontal and vertical equity between individuals with respect to their incomes gross of all federal and provincial fiscal activities. The unitary state to which any such system would be analogous would be one in which the central government provided services in all regions and financed them from a common pool of all tax bases, including provincial source-based taxes; source-based taxes would accrue to the nation as a whole rather than to some subregion(s) of it. As we shall see below, this is the approach that is most consistent with achieving efficiency in the interregional allocation of economic activity.

A second approach to the same equity problem would be to seek to achieve horizontal and vertical equity with respect to individual incomes, inclusive of real income arising from provincial source-based taxes. This is the narrow view of horizontal equity discussed in Chapter 2. The analogous unitary state would be one in which the central government did not have access to source-based taxes but did include in its income tax base an imputation for income from source-based taxes. It would be as if the residents of a province were collective owners of the revenue from source-based taxes. Such an approach would be called for if one held the moral view, or recognized the legal constitutional argument, that property rights over provincial source-based taxes should be granted exclusively to the residents of the province in which the revenues were collected. The previous approach – that of eliminating all interprovincial differences in net fiscal benefits – recognized no such property rights. Under this latter broad view, it would be held that there is no ethical reason to recognize the right to real income that arises simply because a person happens to reside in a province that is rich in source-based taxes. An intermediate position might be to take the moral view that there is no inherent right to such income but yet to recognize an exclusive constitutional right on the part of the provinces to certain source-based taxes. For instance, the granting of jurisdiction over natural resources to the provinces under the BNA Act might be viewed as conferring such a right over source-based taxes on natural resources. The same would not apply to provincial corporate income taxes.

Suppose, however, that we take the view that because the residents of a province have an inherent right to source-based tax revenues we should attempt to achieve horizontal and vertical equity with respect to incomes that include an imputation for income from this source. Is there any need for interprovincial transfers? To see that there is, consider two persons with identical real incomes, inclusive of source-based provincial tax revenues, who live in different provinces. Using the expression for real income in equation 3.4, we have:

$$\begin{aligned} PI_a &+ t_K^a r_a K_a/L_a + t_N^a s_a N_a/L_a \\ &= PI_b + t_K^b r_b K_b/L_b + t_N^b s_b N_b/L_b. \qquad (3.5) \end{aligned}$$

where PI_a is the personal income of a resident in province A, the first two lines on the right side of equation 3.4. Now, unless the per capita source-based tax revenues are identical in the two provinces, these two persons will have different personal incomes. Since the federal tax/transfer system is based on personal incomes, this would mean that persons with identical real incomes would be treated differently in the two provinces, thus violating the principles of horizontal and vertical equity. A person in the "rich" province (the one with the higher per capita source-based tax revenues) would have a lower personal income and hence, under a proportional or progressive tax/transfer system, would pay lower federal taxes (or receive higher federal transfers) than a person with the same real income in a "poor" province. To achieve horizontal and vertical equity, some interprovincial system would be required that would have the same effect as treating these persons identically under the federal tax/transfer system. If an individual's federal tax liability (transfer receipts) is represented by $F(PI)$, then an additional interregional transfer g (positive in the poor province and negative in the rich) is required, so that

$$F(PI_a) - g_a = F(PI_b) - g_b. \qquad (3.6)$$

If $F(\cdot)$ is a linear function (e.g., proportional or linear progressive federal tax system), then equations 3.5 and 3.6 together imply:

$$g_a - g_b = x\,(NFB_b - NFB_a), \qquad (3.7)$$

where NFB_j represents the net fiscal benefits from the provincial budget in province j, or per capita source-based tax revenues in the province, and x is the federal marginal tax rate.

This expression enables us to see clearly the effect of judgments about provincial property rights on the desired equalization program. The first, broad, approach recognized no inherent property rights of residents of a province to the source-based tax revenues that accrue to the province in which they happen to reside. In that case equity required full equalization of interprovincial differences in per capita source-based tax revenues. The second, narrow, approach attempted to achieve equity with respect to individual incomes, inclusive of source-based tax revenues accruing to the provincial government – i.e., we did recognize property rights over this income for provincial residents. In this case we would want to equalize only a portion of the interprovincial differences in net fiscal benefits, with the proposition given by the federal marginal tax rate.

As with the first approach, a system of equalization payments is not the only way to achieve the same effect. Interprovincial differences in federal tax rates would do the same thing except that the interprovincial transfers would be made directly to persons individually. Another method would be for the federal government to introduce a tax/transfer system whose base would be the source-based tax revenues of provincial governments. The latter possibility is precluded in Canada by provisions in the BNA Act that prohibit one government from taxing another (the Crown cannot tax the Crown).

We see, then, that equity arguments call for some equalization of the interprovincial differences in net fiscal benefits that result from provincial government activities. The amount of equalization called for, however, would depend on ethical and/or constitutional judgments about property rights. Our own predisposition is that there is no compelling ethical reason to grant a person the right to real income that accrues simply by virtue of residing in a "rich" province – i.e., one with a relatively high level of net fiscal benefits. Only in the case of legal/constitutional rules that could be interpreted as granting such rights over certain revenue sources would we be inclined to accept them. This might be the case for resource revenues in Canada. With this possible exception we would advocate, on equity grounds, an equalization program that would go towards eliminating interprovincial differences in net fiscal benefits from provincial budgets. The case for full rather than partial equalization will be seen to gain strength when considerations of economic efficiency are taken into account.

Efficiency Arguments for Equalization

Interprovincial transfers will affect the interregional allocation of economic activity (aside from the pure distribution effects) only if there is some mobility of factors of production. Therefore, in order to consider economic efficiency we must relax the assumption of factor immobility made in the previous section. We should note first, however, that the equity arguments are really independent of any assumptions about factor mobility. The real income expression in equation 3.4, for instance, is true regardless of the mobility of any of the factors of production.

The compatibility of equalization and economic efficiency in the use of the nation's resources can best be investigated in a model with perfectly mobile capital and labour. This allows the resource allocation effects of equalization to be maximized. The assumptions of the previous section are retained. In other words, provinces levy taxes on income, capital, and land rents; prices are fixed within provinces; and we assume either that provincial fiscal activity is distributionally neutral or that all persons within a province are identical. This permits us to concentrate on the representative citizen. In addition, to simplify the analysis we assume that the nation's stocks of labour and capital are fixed and that full employment is maintained. These assumptions are not critical to the qualitative results.

To understand the role of equalization it will be necessary to see how interregional transfers bring about the equilibrium allocation of capital and labour between provinces. An equilibrium in this economy will be achieved when capital is allocated in such a way that its return to owners is the same in both provinces, and residents are indifferent at the margin between living in *A* or *B*. Assuming that factor rewards are determined in accordance with their marginal products, then in the absence of provincial government activities or regionally discriminatory federal policies, factors will allocate themselves among provinces over the long run in the most efficient manner – i.e., so as to achieve equality between provinces in the value of the marginal products of mobile factors. Any interregional transfer program, such as equalization, would reduce economic efficiency.

As we have seen already, however, when provincial government activities are taken into account, the real income that a person derives from living in a particular province depends not only on his factor rewards (marginal products) but also on the net fiscal benefits from the provincial budget. Therefore, so long as these net fiscal benefits differ across provinces, labour will not be allocated solely on the basis of its marginal productivity. Similarly, if provincial tax rates on capital also differ, capital will also be inefficiently allocated across provinces. Therefore, economic efficiency would be improved if we could design and implement an interregional transfer system that would eliminate or reduce these distortions that arise from provincial fiscal activities.

To provide a formal analysis of the efficiency case for equalization, we begin by providing an algebraic depiction of an equilibrium allocation of capital and labour between provinces. Before doing so, production possibilities must be described more carefully. Aggregate output in each region is portrayed by the following linear homogeneous production functions:

$$\begin{aligned} X_a &= f^a(L_a, K_a, N_a), \\ X_b &= f^b(L_b, K_b, N_b), \end{aligned} \tag{3.8}$$

where N_a and N_b are given, while

$$L_a + L_b = L \text{ and} \tag{3.9}$$

$$K_a + K_b = K. \tag{3.10}$$

The factor supplies *L* and *K* are fixed.

Capital Market Equilibrium

Suppose that all output prices are fixed and normalized to be unity. Then capital market equilibrium can be written:

$$\begin{aligned} & f_K^a(L_a, K_a, N_a) \cdot (1 - t_K^a) \\ & \quad = f_K^b(L - L_a\ K - K_a, N_b) \cdot (1 - t_K^b), \end{aligned} \tag{3.11}$$

where f_K is the marginal product of capital, and we have used the full employment equations 3.9 and 3.10 to eliminate L_b and K_b. The only endogenous variables in equation 3.11 are L_a and K_a. We take provincial taxes to be exogenous in the analysis to follow.

Equation 3.11 ensures that regardless of where a person resides, the same rate of return, net of tax, is obtained on all capital that he/she owns. In particular, it does not preclude the fact that personal income taxation is paid on capital income at a rate dependent on place of residence. But the same tax rate will be applicable on capital income earned in any jurisdiction by a resident of, say, *A*.

Labour Market Equilibrium

This case is somewhat more complicated. Migration equilibrium will be achieved when real income is the same in both regions for the marginal migrant ($Y_a = Y_b$). Let us write down an expression for Y_a; it will be analogous to equation 3.4:

$$\begin{aligned} Y_a = {} & f_L^a + \theta_a [f_K^a (1 - t_K^a) K_a + f_K^b (1 - t_K^b) K_b] \\ & + \sigma_{aa} f_N^a (1 - t_N^a) N_a + \sigma_{ab} f_N^b (1 - t_N^b) N_b \\ & + t_K^a f_K^a K_a / L_a + t_N^a f_N^a N_a / L_a, \end{aligned} \tag{3.12}$$

where, as before, the terms in t_y^a have cancelled out. There will be an analogous expression for Y_b. For the migrant, *gross* capital and land incomes will not change. Therefore, when Y_a is equated to Y_b the terms involving gross capital and rent incomes will cancel out, leaving the following equilibrium condition:[7]

$$\begin{aligned} & f_L^a + t_K^a f_K^a K_a / L_a + t_N^a f_N^a N_a / L_a \\ & \quad = f_L^b + t_K^b f_K^b K_b / L_b + t_N^b f_N^b N_b / L_b. \end{aligned} \tag{3.13}$$

This is the equilibrium condition for labour markets when no federal government equalization is present. Interprovincial migration decisions are affected not only by differences in productivity (as reflected in the wages that employers are willing to pay) but also by differences in the per capita collections of source-based taxes between provinces. Efficiency in the interregional allocation of mobile factors of production will be seen to require that such decisions be based solely on productivity and not on these fiscal differences. An equalization program that reduces interprovincial differences in source-based tax collections will improve the efficiency of interregional migration decisions.

Let us now consider a crude self-financing equalization scheme that gives a sum g_a to each person in A and g_b to each one in B. One or the other of these must be negative. We shall have to add g_a to the left-hand side of equation 3.13 and add g_b to the right-hand side. Because the scheme is self-financing it must be the case that:

$$g_a L_a = g_b (L - L_a). \tag{3.14}$$

We can use equation 3.14 to eliminate g_a from the labour market equilibrium condition. Once we do that, the condition is:

$$\begin{aligned} & f_L^a (L_a, K_a, N_a) + t_K^a f_K^a (L_a, K_a, N_a) \cdot K_a/L_a \\ & \quad + t_N^a f_N^a (L_a, K_a, N_a) \cdot N_a/L_a - g_b L/L_a \\ & \quad = f_L^b (L - L_a, K - K_a, N_b) \\ & \quad + t_K^b f_K^b (L - L_a, K - K_a, N_b) \cdot (K - K_a)/(L - L_a) \\ & \quad + t_N^b f_N^b (L - L_a, K - K_a, N_b) \cdot N_b/(L - L_a). \end{aligned} \tag{3.15}$$

This equation contains two endogenous variables, L_a and K_a. The equalization variable g_b is a control variable in the hands of the federal government.

Equations 3.11 and 3.15 provide a complete description of the equilibrium in this simple economy. They consist of two equations in the two unknowns, L_a and K_a, with various exogenous provincial tax, technology, and factor supply variables and with the government control variable g_b. Taking the exogenous variables as given, we can solve the system for $L_a(g_b)$ and $K_a(g_b)$.

The Efficient Level of g_b

We can use this simple model to investigate the efficiency consequences of varying g_b. In this model with fixed prices, efficiency or welfare is measured simply by the level of aggregate output for the economy, or GNP, denoted as W:

$$\begin{aligned} W = {} & f^a (L_a, K_a, N_a) \\ & + (f^b (L - L_a, K - K_a, N_b). \end{aligned} \tag{3.16}$$

Totally differentiating equation 3.16 gives:

$$dW = (f_L^a - f_L^b)\, dL_a + (f_K^a - f_K^b)\, dK_a.$$

Since L_a and K_a are functions of the control variable g_b through equations 3.11 and 3.15, this can be rewritten:

$$\frac{dW}{dg_b} = (f_L^a - f_L^b) \frac{\partial L_a}{\partial g_b} + (f_K^a - f_K^b) \frac{\partial K_a}{\partial g_b}. \tag{3.17}$$

Welfare will increase with g_b wherever the right-hand side of equation 3.17 is positive. Furthermore, W will be maximized when the right-hand side is zero, assuming that the appropriate concavity assumptions regarding W are satisfied. Let us examine the optimal choice of g_b first, for a special case of interest and then for the general case.

Special Case: $t_K^a = t_K^b$

Suppose that capital rates are equal across provinces. This is approximately the case in Canada now. Then, from equation 3.11, $f_K^a = f_K^b$ and the last term in equation 3.17 falls out. In this case, increases in g_b raise welfare as long as $(f_L^a - f_L^b)\, \partial L_a/\partial g_b > 0$. Suppose that A is the "rich" region in the sense that it has the most resources (land) to begin with and that resource tax revenues per capita there are higher than in B. Then, the free migration equilibrium with no equalization will have $f_L^a < f_L^b$. Since presumably $\partial L_a/\partial g_b < 0$, initial increases in g_b (and negative values for g_a) will increase welfare. As the value of g_b increases, labour is reallocated from A to B, and f_L^a rises while f_L^b falls. Eventually $f_L^a = f_L^b$, at which point welfare is maximized since $dW/dg_b = 0$.

The value of g_b at this welfare optimum can be obtained from the labour market equilibrium condition (equation 3.15). When $f_L^a = f_L^b$, equation 3.15 can be solved for g_b:

$$g_b = \left[t_K^a f_K^a \frac{K_a}{L_a} - t_K^b f_K^b \frac{K_b}{L_b} + t_N^a f_N^a \frac{N_a}{L_a} - t_N^b f_N^b \frac{N_b}{L_b} \right] \frac{L_a}{L} \tag{3.18}$$

In other words, the per capita payment to B is proportional to the difference in per capita tax collections from source-based taxes between the two provinces. In the example used here, this is positive. The equalization to A is correspondingly negative.

In fact, the equalization scheme obtained here is one that equalizes among the provinces tax revenues obtained from source-based taxes. This is precisely the same equalization as is called for on broad, horizontal equity grounds when provincial residents are judged to have no inherent property rights to increments to income arising from the net fiscal benefits of living in a particular province. In this case, both equity and efficiency call for the same sort of equalization scheme. If such property rights are recognized, however, then the amount of interprovincial redistribution called for on efficiency grounds is *greater* than that called for on equity grounds.

General Case: $t_K^a \neq t_K^b$

When $t_K^a \neq t_K^b$, the last term in equation 3.17 does not disappear. The optimal level of g_b will be that at which the right-hand side of equation 3.17 is zero, or

$$f_L^a - f_L^b = -(f_K^a - f_K^b)\frac{\partial K_a/\partial g_b}{\partial L_a/\partial g_b}.$$

Substituting for $(f_L^a - f_L^b)$ from equation 3.15, the optimal level of g_b is as follows:

$$g_b = \left[t_K^a f_K^a \frac{K_a}{L_a} - t_K^b f_K^b \frac{K_b}{L_b} + t_N^a f_N^a \frac{N_a}{L_a} - t_N^b f_N^b \frac{N_b}{L_b}\right]\frac{L_a}{L} - (f_K^a - f_K^b)\frac{\partial K_a/\partial g_b}{\partial L_a/\partial g_b}. \tag{3.19}$$

This expression is the same as equation 3.18 except for the addition of the latter term involving the capital market distortion induced by provincial capital taxes. What we have here is a conventional problem of the government having too few instruments relative to objectives. There are two distortions to be corrected – a labour market distortion $(f_L^a \neq f_L^b)$ and a capital market distortion $(f_K^a \neq f_K^b)$. The federal government, however, has only one instrument: the equalization indicator of g_b. Equation 3.19 reflects the compromise in the case of g_b, since with it neither the labour nor the capital market distortion is eliminated entirely.

It could be argued that one should ignore the last term in equation 3.19 and base the equalization scheme solely upon differences in source-based tax revenues. For one thing, the latter are readily observable, while the last term of the equation would be very difficult for the government to measure. It involves detailed knowledge of the workings of the economic system – the kind that is not likely to be available, at least with any confidence. Also, one might argue that the final term of the equation arises out of policy decisions taken by provincial governments regarding the correct level of capital taxation. To include it in the equalization formula would be analogous to the federal government overriding a taxing decision of the provincial governments. And since, in fact, t_K^a and t_K^b are likely to be similar, the relative magnitude of the term may be small.

Conclusion

Equalization payments are called for on the grounds of equity and economic efficiency. The purpose of equalization is to reduce interprovincial differences in the net fiscal benefits that arise from provincial budgets. Economic efficiency calls for complete elimination of such differences. Whether equity requires full or partial equalization of net fiscal benefits from provincial fiscal activities depends on judgments about property rights. If provincial residents are deemed not to have inherent rights to real income resulting from such fiscal benefits, then full equalization is called for. If, however, on either legal/constitutional or moral grounds, provincial residents are thought to have some inherent property rights in respect of those net fiscal benefits, only partial equalization is required. Thus there may be some conflict between considerations of equity and efficiency in determining the appropriate amount of equalization. In the event of conflict, efficiency requires more equalization than does equity. Any deviation from the principle of full equalization might be viewed as having an efficiency cost that is inherent in the division of revenue-raising powers in the federal system.

Certain other conclusions are independent of the amount of equalization warranted. We highlight two of them here. First, equalization should be calculated on a net rather than gross basis; i.e., it should reduce the net fiscal benefits of residing in a rich province at the same time that it increases those accruing to residents in a poor province. Second, the base for equalization should be the same regardless of whether we are concerned mainly with efficiency or equity. Under the assumptions made in this chapter, it is only the differences in per capita source-based tax revenues that should be reduced through equalization. Residence-based taxes should not enter into the picture.

In the next two chapters we shall relax our assumptions about the types of taxes and expenditures employed by provincial governments, the incidence of these fiscal measures, and the overall distributional impact of provincial budgets; then we shall examine how these changes in our assumptions will affect the conclusions we have reached so far.

4 Alternative Empirical, Institutional, and Behavioural Assumptions

The analysis of the previous chapter was done using a simple stylized view of the economy that was designed to capture what we regard to be the fundamental operation of the Canadian federal economy. Implicit or explicit in this analysis are a number of assumptions that can be regarded as no better than rough approximations to reality. These assumptions include a simplified view of the manner in which relative prices are determined in an open federal economy; a restriction on the number of tax instruments that provincial governments are assumed to use; a convenient but probably unrealistic view of the nature of the benefits of provincial government expenditures; and some rather extreme assumptions about the mobility of factors of production over provinces. It is the purpose of this chapter to investigate the implications of alternate assumptions about the working of the economy and the nature of provincial taxes and public services for the equity and efficiency arguments for equalization that were developed in the last chapter. We retain the assumption of distributionally neutral provincial budgets. The next chapter investigates the consequences of provincial redistributive activity. While the main thrust of the argument is unaffected, not surprisingly the details of the appropriate equalization scheme will vary depending on the assumptions that are made.

Unfortunately, as one increases the complexity of the model being used to analyse equalization payments, two implementation problems arise. First, the ideal scheme itself becomes more complicated, and less amenable to intuitive explanation, for the policy maker as well as the public at large. Second, and just as important from an economic analysis point of view, the ideal equalization scheme depends upon the values of parameters, variables, costs, and benefits, which are, in practice, unobservable. The most obvious example of this is the fact that the benefits of public services are not readily measurable, and there is no market evaluation to which one could appeal. Although it is unfortunate, it is a fact of life in evaluating public policy. We must base an equalization scheme on things that are readily measurable. Taking that requirement as a constraint, various rational persons might well come to differing judgments regarding the implications of our somewhat abstract analysis for the actual design of an equalization scheme. Our judgment will be based upon what we consider the most likely general description of the workings of the economic system, and we shall reserve it until the final chapter. Nonetheless, it bears repeating that lack of agreement regarding the detailed workings of the economy should not preclude the application of proper economic reasoning to the problem of equalization. That is precisely what has been lacking in the policy debates over equalization in Canada. It could turn out that there is much more to agree with than to disagree with. At the very least, our analysis may serve to bring the differences into sharper focus.

We shall begin with what most economists probably find most disagreeable about our modeling – the simplistic production and pricing structure. Subsequently, we shall investigate the imperfect mobility of labour (because of migration costs); the existence of alternative provincial taxes; alternative views about the nature of the benefits of provincial public services, and interprovincial differences in the cost of providing public services. Throughout the analysis, an important caveat should be borne in mind – one that will be of no comfort to the sceptical reader. Regardless of what other behavioural assumptions are made, the decentralized economy will be viewed as working in a competitive manner. Furthermore, we shall eschew the possibility of strategic behaviour on behalf of the provincial governments. These are not things that economic analysis can readily handle.

Price Variability and Multi-Goods Models

The analysis of the previous chapter took all relative output prices as fixed and assumed that production in each province could be aggregated into a single Ricardian-type production function. The fixity of relative output prices is justifiable if one views the provinces as small, open economies producing traded goods for a wider potential market. It is not justifiable (except perhaps as an approximation) if there are transport costs or if nontraded goods exist. Furthermore, if relative output prices are fixed, we have taken no account of the well-known factor-price-equalization results of the international trade literature that hold in models of this sort.[1] Our previous analysis can be amended to include them.

Consider factor price equalization first. The equity analysis of equalization payments in no way depends upon the way in which factor prices are determined, but only upon the equilibrium factor prices themselves. Therefore, the equity argument for a scheme of equalization based upon source-based tax collections continues to hold whether the production side of the economy is specified to be Ricardian, Heckscher-Ohlin, or any other. It is the fixity of output prices that is critical for the design of equalization, not the manner in which factor incomes are determined.

As far as the efficiency analysis of equalization is concerned, consider the case of free mobility of labour analysed in Chapter 3. It is easy to see that factor price equalization is generally incompatible with free migration in a federal model of the economy. Under free migration, persons will migrate until their real incomes are equalized over provinces. Whenever provinces levy source-based taxes, the free migration equilibrium will not entail equal marginal products or wage rates, except in the unlikely case that per capita source-based tax collections are identical over provinces. If the conditions for factor price equalization are otherwise satisfied, provinces must be driven by migration to positions of specialization in order for the migration equilibrium condition to be satisfied. The important point is that free migration must ultimately lead to the migration equilibrium condition being satisfied. Since our efficiency case for equalizing source-based tax collections was based upon satisfaction of this condition, our analysis is not affected by the tendency towards factor price equalization.

The possibility of output price variability, on the other hand, can cause fundamental problems mainly on account of the fact that the personal income tax has as its base nominal income rather than real income. Consider the complications for equity that arise as a result of output price variability. As a general point, whenever the cost of living, as measured by some suitable index of prices, varies from one locality to another, the personal income tax as presently constituted cannot be a perfect instrument for the pursuit of equity. The tax base used is nominal income and the same nominal income in different localities will correspond to differing real incomes. The only way to correct this situation would be to base the personal income tax on real income, and that would be unfeasible. In any case, it is not clear that this general problem of differing price indexes is of particular relevance for interprovincial equalization schemes since there is no reason to believe that homogeneous price indexes coincide with provincial boundaries.

The exception to this is when the source of the differing price indexes is the budget policies of the provincial government itself – for example, when differing tax rates give rise to differing price indexes. This will turn out to be of more relevance later when we consider alternative tax instruments and alternative ways of modeling the benefits of provincial public activities (including the pricing of publicly produced output). For now, let us look at the issue of price variability within the context of the basic model of the previous chapter. In that model, we assumed the problem away by treating output prices as fixed. Suppose, however, that output prices are not completely fixed and that part of the incidence of provincial taxes are shifted forward to consumers in the form of higher prices. The issue then becomes rather complicated, and a thorough analysis of it would involve a complete model of interregional and international tax incidence. We can, however, discern at an intuitive level the sorts of influences that are at work.

Suppose that part of the source-based tax collections in a province are shifted forward in the form of higher producer prices. The relevance of this for the equalization issue would depend solely upon the extent to which the higher producer prices raised the price index to residents of that province relative to the price index of other provinces. In principle, the higher producer prices could reduce the real incomes of domestic residents, the residents of other provinces, and foreigners, depending on who consumed the output of the province in question. One might expect that most price variability would occur on nontraded goods rather than traded goods, especially if capital returns after tax were dictated by worldwide capital markets. If that were the case, most of the incidence of the rise in provincial producer prices would be upon provincial residents. To that extent, the ideal amount of equalization owing *by* that province should fall, while that owing *to* that province should rise. Thus if there is some output price variability, the theoretical argument for full equalization of source-based taxes will have to be tempered by an amount equal to the per capita reduction in the real income of residents of the province concerned. The extent of this effect is a matter for empirical investigation. From a policy point of view, it is unlikely that sufficiently reliable estimates would ever be available. In our view, this constitutes another reason why one might wish to settle for less than full equalization.

The case with the personal income tax is analogous. If it is partly shifted forward in higher prices, that will be reflected in differing price indexes over regions (although, again, not necessarily demarcated by provincial boundaries). Ideally, vertical equity would suggest that the federal income tax base ought to be adjusted to account for this. One might expect that provinces with large provincial income tax collections per capita would have more equalization owing on this account; exactly the opposite is true, however, under the present scheme. Once again, it is very difficult to verify the extent to which personal income taxes are shifted forward. The prevailing wisdom is that they are not;[2] and this is strengthened by the openness of provincial economies. It would, therefore, be very difficult to justify bringing this sort of consideration into the equalization formula.

In the event that labour is freely mobile among provinces, efficiency considerations have the same implications for equalization as do equity considerations when there is price variability. With costless migration, the most efficient allocation of labour will be that which results in the value of the marginal product of labour being the same in both provinces. Workers, however, will migrate until their real incomes are identical in both regions; and that may not necessarily coincide with the optimal allocation. On the one hand, differences in per capita tax collections from source-based taxes will provide an incentive to migrate towards the province with the largest per capita collections. On the other hand, this will be offset to the extent that the higher tax collections are associated with higher provincial prices. The passing on of taxes through higher local prices will reduce the case for equalization of source-based taxes.

Migration Costs

So far we have been considering the extreme cases of zero migration costs and prohibitive migration costs. In practice, the truth lies somewhere between the two. We do observe some migration in the real world, but it is apparently far from perfect. It is convenient to think that this is because of the costs associated with migrating from one province to another, whether they be actual out-of-pocket expenses or nonpecuniary (psychic) costs. Furthermore, we might presume that for different persons there are different potential costs of migration and that those with the lowest costs would migrate "first." Thus we think of the migration costs for the marginal migrant as rising with the number of migrants. The migration equilibrium would then be characterized by equality between real income in the receiving province and real income less migration costs in the sending province.

The presence of finite migration costs is of no great consequence for the equity arguments in favour of equalization. The analysis of the previous chapter continues to apply in the sense that the tax base used under the federal personal income tax does not measure the true real incomes of individuals. In particular, it neglects the per capita benefits to individuals arising out of the collection of source-based taxes. These should still be equalized on equity grounds. The only additional complication that migration costs introduce arises from the fact that they ought to be fully deductible from income for tax purposes since they represent costs of earning income. This is approximately the case now under the existing tax system, at least for the physical expenses of moving.

The efficiency case for equalization can also be readily amended to allow for migration costs. Using the model of Chapter 3, suppose that migrants move from province *B* to province *A*. The marginal migrant bears a migration cost of $m(L_a)$ where $m'(L_a) > 0$ (since a larger L_a reflects a greater amount of migration and therefore a higher cost at the margin). The migration equilibrium condition becomes:

$$\begin{aligned} & f_L^a + t_K^a f_K^a K_a/L_a + t_N^a f_N^a N_a/L_a - g_b L/L_a \\ & \quad = f_L^b + t_K^b f_K^b K_b/L_b + t_N^b f_N^b N_b/L_b + m(L_a), \end{aligned}$$

where, as before, $L = L_a + L_b$ and $K = K_a + K_b$. The capital market equilibrium condition is unchanged and, along with the above, can be solved for L_a and K_a in terms of g_b. From the solution for those variables, all others can be solved.

The amount of interprovincial transfer (g_b) considered to be efficient is determined by maximizing an index of welfare that includes the level of aggregate national output amended by the costs of migration starting from some initial allocation. We write social welfare as:

$$\begin{aligned} W = {} & f^a(L_a, K_a, N_a) + f^b(L - L_a, K - K_a, N_b) \\ & - \int_{\bar{L}_a}^{L_a} m(L_a)\, dL_a. \end{aligned}$$

By totally differentiating this expression, we obtain:

$$dW = (f_L^a - f_L^b + m)\, dL_a + (f_K^a - f_K^b)\, dK_a.$$

Using the migration equilibrium expression, the characterization of the optimal equalization scheme here is identical to that obtained in Chapter 3.

For example, consider the special case in which $t_K^a = t_K^b$. In this case, $f_K^a = f_K^b$, and the latter term in the welfare change expression drops out. The welfare optimum will occur when

$$\frac{\partial W}{\partial g_b} = (f_L^a - f_L^b + m)\frac{\partial L_a}{\partial g_b} = 0$$

or, $f_L^a = f_L^b - m$. From the migration equilibrium condition, this will occur when g_b is chosen exactly according to equation 3.18, to equalize the difference in per capita source-based tax revenues among provinces. It is also fairly easy to see that the more general formula for g_b obtained when $t_K^a \neq t_K^b$ (equation 3.19) continues to hold in the presence of migration costs.

We conclude therefore that the logic of Chapter 3 is independent of the presence of migration costs, provided that those migration costs are deductible from income for personal income tax purposes. Both equity and efficiency arguments support the contention that per capita source-based taxes should be equalized, regardless of the magnitude of migration costs.

Other Types of Provincial Taxes

So far our analysis has been restricted to the case in which provinces levy either personal income taxes or taxes on factor incomes at source. This enabled us to develop the principles of our argument in relatively simple models. Provinces do receive tax revenues from other sources, the most important of which are indirect taxes of various sorts, including the retail sales tax and specific excise taxes. As well, special consideration should be given to the property tax, which, though generally levied at the municipal level, has implications for interprovincial equity and efficiency.[3] We shall discuss these two cases in turn.

Indirect Taxes

In our discussion we need not distinguish between general and specific indirect taxes. The equity case for equalizing indirect taxes depends upon the extent to which the taxes are shifted into higher prices to consumers. Consider the extreme case in which the taxes are not shifted to consumers but instead are borne entirely by reduced producer prices. The taxes, in this case, are in every way analogous to the source-based taxes discussed earlier. Consumer prices remain unchanged, while the drop in producer prices means that factor incomes will also fall. This fall in factor incomes will be reflected in lower personal income in the tax base. On the other hand, the tax revenue generated by the indirect tax will represent a source of real income for the residents of the province that is not reflected in the federal income tax base. Just as with source-based taxes, this source of tax revenue should be equalized. Efficiency arguments, as well, point in exactly the same direction.

The chance of indirect taxes being completely absorbed in producer prices, however, is most unlikely. At least some, and perhaps most, of the goods consumed in a province will be traded more widely with residents of other provinces and foreigners. From the point of view of the province under consideration, they could well be virtual price-takers in the markets for these goods. That being the case, a tax on the consumption of such goods would be fully shifted to consumers in the form of higher prices. Furthermore, we would expect that a high proportion of the taxed goods consumed would be purchased by residents of the province, since the taxes tend to be at the retail level. Let us therefore consider the extreme case in which the indirect taxes are fully shifted forward and are borne entirely by domestic residents through higher prices.[4] In this case, the tax is exactly the same as a residence-based tax (e.g., income tax). The nominal incomes of residents remain unchanged while their real incomes fall because of the rise in consumer prices. Disregarding dead-weight losses from the tax, the fall in real incomes as a result of the price rise completely offsets the rise in real incomes made possible by the tax revenue that accrues to the provincial government. No net benefit or source of real income is obtained by consumers that is not reflected in the nominal incomes used in the tax base. There is therefore no equity case for equalizing indirect tax revenues. By the same token, no artificial incentives are set up to encourage individuals to migrate, so that no efficiency case exists for equalization.

The above equity result must be moderated to the extent that the taxes are not shifted forward through higher prices and to the extent that the higher prices are not incident upon the residents of other provinces consuming goods sold in the taxing provinces. Although it is ultimately a matter for empirical investigation, our view is that, as a first approximation, it would be sensible to view the indirect taxes of provinces as being shifted forward to their own residents in the form of higher prices.[5] That being the case, we would treat the indirect tax revenues of provincial governments as though they were residence-based taxes and would not equalize them if it was believed that provincial budgets were distributionally neutral.

Property Taxes

The desirability of equalizing property taxes is somewhat more problematic, since there is considerable disagreement about the incidence of such taxes. As well, property taxes are levied on the real property of both residents and firms, and that complicates matters because different arguments apply to each. Let us first concentrate on the real property tax on firms. In essence it is very similar to the corporate income tax, since a tax on capital values can be viewed as equivalent to a tax on the future income stream generated by the capital. If output prices are fixed, the property tax must result in reduced factor incomes. In this case, the property tax revenues will represent a source of real income to the residents of the province that is not reflected in the federal income tax base. As in the case of the corporate tax, property tax revenues should be equalized. The strength of this case will be reduced to the extent that the property tax is passed on in the form of higher prices for goods consumed by residents. In view of the openness of provincial economies, we would argue that this is unlikely to be significant; thus we would equalize the property taxes paid by firms.[6]

Residential property taxes are somewhat different in nature since they are levied upon assets whose services are consumed rather than used as a factor of production. Not only that, the services being consumed can be characterized as "nontraded" goods, so it is conceivable that part of the tax would result in higher prices for the taxed item (e.g., housing). The property tax on residential property is somewhat analogous to indirect taxation. If property taxes were completely shifted forward to the users of the real property being taxed, regardless of whether they were renters or owner-occupiers, the tax revenue benefits would be completely offset by higher prices (excluding the dead-weight losses) without affecting taxable income. In this case, no equalization would be warranted. It is exactly the same as when indirect taxes are shifted forward in higher prices.

At the other extreme, the residential property tax could be completely borne by the producers of housing services. Here, factor incomes would decrease by the amount of the tax, and this would be reflected in lower personal income for tax purposes. Personal taxable income would not in this case coincide with real income, since the tax revenues of the provincial government are available to provide public expenditure benefits to citizens. Equalization would be necessary.

One's judgment as to whether residential property taxes should be equalized thus depends intimately upon one's view of the incidence of that tax. This is a matter upon which there is very little agreement among economists. One might complicate matters even further by dividing residential real property into land and structures. A good case could be made for suggesting that only the property tax component on structures be shifted forward for the most part. It would be hard to justify subjecting the residential property tax to full equalization, since that would imply zero shifting, which is most unlikely. If pressed on the issue, we would probably say that a large part of the residential property tax is shifted forward and, like the indirect taxes, should not be equalized. This view is not held with a great deal of conviction, but, if accepted, it suggests equalizing the part of the property tax that falls upon firms rather than residents.

The upshot of our discussion on other taxes is that, in addition to the source-based taxes levied upon capital and resources, that part of the property tax levied on firms might be equalized. One would be justified in treating the myriad of indirect taxes – ranging from specific excise taxes on tobacco, alcohol, gasoline, motor vehicle licences, and the like, to the more general retail sales tax as residence-based taxes. They would not be equalized under distributional neutrality.

Alternative Views of the Benefits of Provincial Government Activity

So far we have assumed that provincial governments use their tax revenues to provide quasi-private goods that yield consumption benefits to the residents of the province. This is a vast oversimplification of the nature of provincial government activity. The goods and services provided by provincial governments may be partly or wholly "public" rather than "private" in nature. They may accrue not only to residents but also to firms and to nonresidents. The benefits of provincial government activity may take the form of something other than the goods and services provided. For example, publicly owned enterprises may provide goods at lower prices in one province than in neighbouring provinces. Even the regulatory functions of provincial governments may constitute a form of benefit for residents. In principle, all these things should be taken into account in designing an ideal equalization scheme. In practice, that may be impossible because of information constraints. What follows is a discussion of the effects on ideal equalization of alternative ways of viewing the benefits of provincial government expenditures.

Intermediate Goods

Some of the goods and services that provincial governments provide are used as intermediate inputs in the production processes of firms. An obvious example of this is roads and bridges. To the extent that the provincial budget is spent on goods used by firms, residents no longer derive benefits from them directly, and our earlier arguments must be amended. The simplest case to imagine is that in which the output prices of the firms are fixed. Then, all the benefits of the intermediate goods will show up as higher factor payments. If these higher factor payments accrue to the residents of the province, they will be fully captured in the personal income tax base. If they had been financed out of source-based taxation or, more generally, out of a source of taxation that would otherwise be subject to equalization, the tax revenues would not need to be equalized on equity grounds since their benefits would be fully captured by the income tax. To equalize would be to engage in "double" redistribution. On the other hand, if the source of taxes were those not subject to equalization, the fact that the benefits from tax collections would increase the taxable income of provincial residents for federal tax purposes would imply that the province should have negative equalization, or equalization owing.

The benefits could also have accrued to nonresidents who owned factors of production in the province. In that case, none of the benefits of the tax revenues would accrue to residents. If the taxes had been source-based taxes, no equalization would be desirable; if non-equalized tax sources had been used, however, a negative equalization payment would be justified, since residents would be getting no real income benefit from the tax revenues collected.

To summarize, to the extent that output prices are fixed so that intermediate inputs provide benefits in the form of increased factor incomes, the equalization base of the province should fall by the amount of provincial tax revenues devoted to providing intermediate goods. This should be the case regardless of the tax source used by the province and regardless of whether the factor incomes accrue to residents or nonresidents.

On the other hand, some of the benefits of the intermediate goods could result from reduced output prices and the consequent rise in the real incomes of consumers. If this should occur, and if the beneficiaries are provincial residents, the benefits to residents will be the kind that are not reflected in taxable income. Nominal income will not have been affected, while real income will rise because of the decline in price. In this case, no change will be called for in the equalization entitlement. This argument will be tempered to the extent that the benefits of the reduced prices accrue to nonresidents who consume the products whose prices have fallen.

Overall, then, we can state how the use of tax revenues to provide intermediate goods instead of private consumer goods should, in principle, affect the equalization formula. The base used to compute equalization entitlements (i.e., source-based tax revenues) should be reduced by the amount of provincial expenditures used to provide intermediate goods to firms less the amount of those benefits that accrue to residents of the province through lower prices. It can be readily seen that the government is unlikely to be able to estimate with any accuracy the extent to which this is an important source of amendment to the equalization scheme. It will be so to the extent that different provinces spend different amounts per capita on intermediate goods. Unfortunately, we have very little evidence in that regard. Lacking the empirical basis, on which to make a decision one way or another, this source of change in equalization entitlement would inevitably have to be omitted.

There is another possible view to support the notion that source-based taxation should not be fully equalized. Suppose that source-based taxation were, in part at least, an implicit form of benefit taxation levied on firms to cover the provision of public services. The property tax on firms might fall in this category, for example. Similarly, taxes on resource industries might be viewed in part as sources of revenue used to provide the social infrastructure required to support resource industries that are typically in more remote areas. To the extent that this were true, it would tend to establish a correlation between the source-based tax revenues of a province and its expenditures on intermediate goods. This would provide yet another argument in favour of less-than-full equalization of source-based tax revenues.

Capture of Rents through Reduced Prices or Crown Corporation Profits

We have proceeded so far on the assumption that rents that are captured by provincial governments on resources are gathered in the form of tax revenues, such as royalties or leases. As the example of hydroelectric power makes clear, that is not the only method of obtaining rents. The rents might be obtained instead in the form of profits by provincially owned Crown corporations; or they might be disbursed to consumers in the province by means of lower consumer prices (just as, on a nationwide basis, a good part of the rents from oil and natural gas are spread across the country). These alternative methods of capturing the rents ought to be included in the equalization formula on a par with source-based tax revenues.

If the rents captured take the form of Crown corporation profits, the case is clear-cut and differs in no essential way from the taxing of rents in the hands of private corporations. Similarly, if they go to residents in the form of reduced prices, this is also a source of benefits that is not reflected in the nominal tax base of the federal income tax system. In practice, of course, the benefits accruing through reduced prices are harder to monitor. There is the additional problem that some of the benefits from reduced prices will go to either nonresidents or firms consuming the resource (e.g., electricity). That portion of the benefits should not be equalized on the assumption that those which go to firms are reflected in higher factor incomes. But, overall, the principles governing rents that are captured by ways other than source-based tax revenues are exactly the same as those already discussed for source-based tax revenues.

Another possibility is that, because of resource management methods and other institutional features, a share of the rents from provincial resources will accrue to workers in the form of higher wages.[7] In this case there is no equity argument for equalization because this portion of the rents shows up in a form that is fully captured by existing programs involving tax transfers between individuals. On the other hand, economic efficiency would call for equalization of this segment of the resource rents, because these rents cause workers to be paid in excess of their marginal product.

Provincial Saving

The Alberta Heritage Trust Fund illustrates another possible use of provincial tax revenues. A portion of the revenues from some tax base (in this case, a source-based tax) might be put directly into a savings fund instead of being used for expenditures that would benefit current residents. To work out the implications of this in our previous model, we would have to modify the provincial government budget constraint in equation 3.2. The effect of this modification would be to show that it is only the portion of tax revenues that are actually used to provide benefits to current residents that is relevant for equalization purposes. In the long run, abstracting from all other possible qualifications, it is only the resource revenues that are *not* invested in the savings fund, *plus* any revenues from the fund that are used to finance current services, that should provide the basis for equalization in any year.

Provincial Public Goods

Our analysis of equalization has proceeded on the assumption that provinces use their tax revenue to provide quasi-private goods and that, aside from the redistributive effects of the provincial budget, this is a simple substitute for private spending. If the provincial governments also supply public goods, the measurement of net benefits becomes more complicated, but the principle of equalization does not. Indeed, as Flatters, Henderson, and Mieszkowski (1974) showed, there are additional arguments for equalization that are based on the special properties of public goods. The analysis of pure public goods would take us too far afield at this point.[8] In any case, it would seem that equalization motivated by public-good considerations would be of a secondary order of magnitude compared with that outlined above.

Interprovincial Differences in the Cost of Public Services

We have so far assumed that one dollar's worth of tax revenues provides the same value of provincial public services in all provinces; however, just as output prices vary from province to province, so does the cost of providing public services. For example, differences in terrain cause highway costs to vary. In principle, the equalization scheme should account for this; in practice, however, it is difficult. If the value of public services per dollar of tax revenues is lower in one province than another, the equalization base should be correspondingly lower as well. Naturally, there are insuperable measurement problems involved in determining whether such costs do vary systematically over provinces. The present scheme ignores them, and it seems likely that any future scheme will have to do the same.

Regional Biases in Federal Government Policies

Finally, let us take note of one possible view of equalization as being a *quid pro quo* to the have-not provinces for the alleged bias that federal government policies have towards the better-off provinces. This view is directed as much towards federal regulatory policies – such as transportation pricing and tariff protection for centrally based manufacturing – as it is to actual federal expenditures. This is obviously not the place to get into a controversy over who benefits most from Confederation. In regard to their implication for equalization policy, two points could be made. First, if federal policies are perceived to be regionally discriminatory and if that is thought to be bad, the first best course of action would be to change the federal policies themselves. Second, if, for whatever reason, it was considered unfeasible to change these policies, it is highly unlikely that the optimal "second-best" policy would be a scheme that equalized on the basis of tax capacity of one sort or another. Indeed, Alberta and Saskatchewan would be unlikely to think so. Nor is it obvious what the second-best policy should be, in view of the disagreement about the regional bias of federal policies. It would seem reasonable not to take these kinds of arguments into consideration when designing an appropriate equalization scheme.

5 The Case for Equalizing Residence-Based Tax Collections: The Implications of Non-Neutral Provincial Budgets

Our arguments thus far have been based upon a rather specific judgment about, first, the constitutional division of powers concerning the right to pursue redistributive policies and, second, the extent to which provincial governments undertake redistribution within their boundaries. In particular, we have proceeded on the assumption that provinces should be able to pursue whatever redistribution is compatible with the tax and expenditure instruments at their disposal. Indeed, it would be practically impossible to deny them that power, since almost any action that a government undertakes will have redistributive consequences. We have also assumed that the federal government should not attempt to undo the redistribution that each province undertakes in its pursuit of vertical equity. Our equalization scheme was thus designed to be one that would attain vertical equity (and efficiency) nationwide if the provinces agreed to the federal norms of vertical equity and pursued tax and expenditure policies that were distributionally neutral in the sense that each citizen obtained the same net benefit from provincial government activity.

Our analysis, therefore, proceeded by considering the representative citizen in each province under the assumption that there was no intraprovincial redistribution by provincial governments. Using that framework we argued that there exist both equity and efficiency arguments in favour of equalizing source-based tax revenues among provinces. This scheme was argued to be the kind of equalization program that would be called for if provincial governments were distributionally neutral in their activities.

In this chapter we investigate the consequences of adopting another assumption concerning the redistributive activities of provincial governments. In particular, we take it as given that provincial governments are not distributionally neutral, and we ask how the federal government might wish to take that into account in its own redistribution policies, particularly equalization. It is not necessary to view the federal government as wishing to impose its will on the provinces as far as redistribution is concerned, although that may be the case. Federal and provincial governments have certain tax and expenditure instruments that they can use to influence the distribution of income. Their redistributive goals may or may not be similar. We might think of the set of policies that would eventually emerge as one in which each government was satisfied with the redistributive consequences of its policies, given the instruments at its disposal and the effects of the policies of all other governments. This could essentially be described as a Nash equilibrium. Any change in the external environment, in the goals of any government, or in the allocation of tax and expenditure powers between governments would be likely to lead to a different set of redistributive policies. Although all governments would take the actions of other governments into account, no government could be said to be overriding the redistributive decisions of other governments.

Let us take a brief look at the actual redistributive policies employed by provincial governments in Canada. On the tax side, consider the two main sources of taxation other than source-based taxes – personal income tax and indirect taxes. Regarding the former, all provinces except Quebec are signatories to a tax collection agreement that virtually ties the provincial income tax to the federal base and rate structure. Regarding the indirect taxes, there is limited scope for redistribution here, since they are levied on anonymous expenditures and not on persons individually. The general sales tax is roughly proportional to income, while specific sales taxes are likely to be much more regressive in nature. Overall, provincial direct and indirect taxes are roughly proportional to income or possibly slightly progressive.

On the expenditure side, provinces probably have more leeway for redistribution in some programs than in others. Certain expenditures, by their very nature, can be viewed as providing roughly equal per capita benefits, which are spread uniformly over the population. Education and health expenditures can be thought of in this way. Others, like the social welfare responsibility of provincial governments, are more likely to be progressive, in the sense that their benefits accrue relatively more to low-income groups. Still others may be regressive – for example, the protection of property and the provision of transport facilities.

While it is difficult to be certain, it could reasonably be argued that, apart from the contribution of source-based taxation, provincial budgets by their nature tend to be redistributive, at least in part. It would not be too misleading to characterize provincial taxes as being proportional to income – and provincial expenditures as being distributed on an equal per capita basis. If this is so, it would imply that provincial budgets are redistributive overall. In this chapter we pursue the consequences of this for federal government redistributive policy, in particular for equalization payments. We shall begin by assuming that there is fairly widespread agreement between the provinces and the federal government as to the amount of redistribution of personal real incomes to pursue for vertical equity reasons. The amount of redistribution that the provinces undertake will be assumed to be consistent with those goals and with the redistributive policies of the federal government. Then we shall try to ascertain how the federal government should pursue vertical and horizontal equity nationwide in view of the provincial redistribution that is already presumed to be taking place and, in particular, what the role and scope of equalization should be in this case. It turns out, perhaps surprisingly, that a case can be made for including personal income taxes and indirect taxes in the equalization formula.

The Equity Argument for Equalizing Residence-Based Taxation

The case for equalizing residence-based taxes was illustrated by means of a simple example in Chapter 2. We shall now present this case more generally, using the algebraic methods of Chapter 3. The crucial assumption to be relaxed is that all persons within a province are identical. This is necessary before intraprovincial redistribution can make any sense; however, it will no longer be possible to speak of a representative individual in a province. Real incomes of persons within a province will differ because of differences both in incomes from factors of production and in shares of the fruits of provincial government activity. Let us retain all the other assumptions of Chapter 2 and consider the i^{th} person in province *A*. Using the superscript *i*, where appropriate, to denote individual *i*, the expression for real income *Y* after provincial government activity, analogous to that for the representative individual in *A* given by equation 3.3, becomes:

$$\begin{aligned}
Y_a^i = {} & W_a^i + \theta_a^i \left[r_a (1 - t_K^a) K_a + r_b (1 - t_K^b) K_b \right] + \sigma_{aa}^i s_a (1 - t_N^a) N_a + \sigma_{ab}^i s_b (1 - t_N^b) N_b \\
& - t_{ya}^i \left[W_a^i + \theta_a^i (r_a (1 - t_K^a) K_a + r_b (1 - t_K^b) K_b) + \sigma_{aa}^i s_a (1 - t_N^a) N_a + \sigma_{ab}^i s_b (1 - t_N^b) N_b \right] \\
& + \alpha_a^i \{ t_K^a r_a K_a + t_N^a s_a N_a + t_y^a [\Sigma W_a^i + \Sigma \theta_a^i (r_a (1 - t_K^a) K_a + r_b (1 - t_K^b) K_b) \\
& + \Sigma \sigma_{aa}^i s_a (1 - t_N^a) N_a + \Sigma \sigma_{ab}^i s_b (1 - t_N^b) N_b] \}, \qquad (5.1)
\end{aligned}$$

where α_a^i is the share of the benefits of expenditures out of *A*'s provincial tax revenue that goes to individual *i*.

The first line on the right side of equation 5.1 represents *i*'s gross income from wages, capital, and rents. It differs from one individual to the next because individuals have differing wage rates and differing shares in the ownership of capital and land. The second line, the term in t_{ya}^i, is the payment of provincial income tax by *i*. This differs among individuals because factor incomes differ, and so might the provincial income tax rate if it depends on the level of income. The final term, in α_a^i, represents the amount of the provincial public expenditures consumed by *i*. The term $\{\cdot\}$ is total provincial tax revenues, all assumed to be spent on services for provincial residents; α_a^i is individual *i*'s share of these services; and t_y^a is the average personal income tax rate in the province. In general, this will also differ among persons as the incidence of provincial expenditures is unlikely to be divided equally among residents.

Once again, vertical equity dictates that Y_a^i should be the basis for redistributive federal tax/transfer programs covering all individuals. This is not the case, however, since such programs (e.g., personal income tax) include in their base only the gross income from labour, capital, and land (i.e., the first line of equation 5.1). While this makes the tax/transfer system satisfactory as a means of reducing inequalities in income from factors of production, it does not take account of the real income differences that arise from differences in the net benefits obtained from the provincial public sector (the last two terms). If the federal government wished to pursue full vertical equity, it would have to redistribute according to the terms involving α_a^i and t_{ya}^i. As can be seen from equation 5.1 transfers to provincial governments would be inadequate since what is required is a different amount of equalization for each person in each province, and that could only be done by transfers to individuals.

We would like to stress, however, that it would be inappropriate for the federal government to pursue full equalization in accordance with the dictates of equation 5.1. If the federal government were to pursue full equalization among individuals, it would be overriding the redistributive decisions of the provincial governments over the disposal of their own revenues. This would amount to denying the provinces a significant role in the redistribution of their own tax revenues. It is inevitable that some such conflict will arise between the redistributive actions of the provinces and that of the federal government. The compromise advocated here – and the one that is implicit in the present equalization scheme – is for the federal government to equalize in such a way as to *make it possible* to achieve full horizontal and vertical equity for all individuals. But the provinces must be permitted to redistribute their own tax revenues as they see fit.

In the cases considered in Chapter 3, where all the individuals in each province had the same incomes, our equalization scheme would have made it possible to achieve horizontal equity. If one province should decide to redistribute income from right-handed to left-handed people, however, horizontal equity would not be attainable. This would not be grounds, we argue, for the federal government to introduce an equalization program that would bypass provincial governments and undo these redistributive actions.

It is possible, however, that when income levels vary within provinces, the systematic pursuit of redistributive goals by provincial governments will affect the design of an appropriate equalization program. First, consider the case where provincial government tax/expenditure policies are distributionally neutral. Examination of equation 5.1 will show that if all individuals' shares of consumption of provincial services are equal to their shares of the personal income tax bill in a province, the expression for Y^i_a becomes:[1]

$$\begin{aligned} Y^i_a = {} & W^i_a + \theta^i_a\,[r_a(1-t^a_K)K_a + r_b(1-t^b_K)K_b] \\ & + \sigma^i_{aa}s_a(1-t^a_N)N_a + \sigma^i_{ab}s_b(1-t^b_N)N_b \\ & + \alpha^i_a(t^a_K r_a K_a + t^a_N s_a N_a). \end{aligned} \tag{5.2}$$

This is almost identical to our previous equation 3.3, and from it follows a similar conclusion. The only basis for an equalization program is the systematic interprovincial differences in revenues from source-based taxes, and it is the equalization of these differences that will make it possible to achieve horizontal and vertical equity. When provincial governments are distributionally neutral in their fiscal activities, it is only the source-based tax revenues that should be equalized across provinces.

Suppose now that the provinces are not neutral in their fiscal behaviour. We shall examine a case in which all provincial fiscal structures are made moderately progressive by distributing provincial services on an equal per capita basis across individuals, while levying a proportional tax on personal incomes in each province. As we have already indicated, this seems to be a reasonable depiction of provincial government behaviour in Canada. Rewriting equation 5.1 as in note 1 and observing that in this case $t^i_{Ya} = t^a_Y$ and $\alpha^i_a = 1/L_a$, where L_a is the number of people in province *A*, we get the following expression for the real income of a resident of *A*:

$$\begin{aligned} Y^i_a = {} & PI^i_a + t^a_Y(\overline{PI}_a - PI^i) \\ & + 1/L_a\,(t^a_K r_a K_a + t^a_N s_a N_a), \end{aligned} \tag{5.3}$$

where PI_a is the average level of personal income in province *A*. The net change in a person's income from provincial fiscal activities now comprises two effects: first, as before, there is the provision of services financed out of source-based tax revenues, the term in $1/L_a$; and, second, there is the effect of the progressive tax/expenditure structure, the term in t^a_Y. If a person's income is below the provincial average, his share of benefits from provincial services is greater than his share of the taxes, thus raising his real income; the reverse is true if his income is greater than average. In previous cases where either all individuals were alike in a province or the provincial fiscal structure was distributionally neutral, the term in t^a_Y was always zero and hence never appeared in the expressions for Y^i_a.

As in Chapter 3, we are faced with two possible approaches to the equity problems that arise from the differences in net fiscal benefits (NFB's) between provinces. The broad approach, consistent with the view that provincial residents have no inherent property rights to the additional real income that arises from such fiscal benefits, is to attempt to achieve horizontal and vertical equity with respect to personal incomes exclusive of the fiscal benefits from provincial budgets. The narrow approach is to consider such benefits as belonging to the residents of the province in which they accrue and to seek to achieve horizontal and vertical equity with respect to incomes inclusive of these benefits. Especially with respect to the fiscal benefits that arise from residing in a high-average-income province, we favour the broad approach; we see no ethical argument to support the ownership of fiscal benefits that result merely from living in the company of rich persons. We shall examine the consequences of both approaches with respect to the design of an equalization program, however.

The broad approach, as we have said, is to pursue equity with respect to incomes exclusive of net fiscal benefits from provincial budgets – i.e., with respect to the term denoted $PI^i_j\,(j=a,b)$. Now if we compare residents of *A* and *B* who have identical personal incomes $(PI^i_a = PI^i_b)$, their real incomes will differ because of differences in both the source-based tax revenues of the provinces and the personal income tax structures. Assuming that both provinces have the type of fiscal structure just described, we can use equation 5.3 to compare the real incomes of persons in *A* and *B* who have identical personal incomes:

$$\begin{aligned} Y^i_a - Y^i_b = &\left\{1/L_a\,(t^a_K r_a K_a + t^a_N s_a N_a) - 1/L_b(t^b_K r_b K_b + t^b_N s_b N_b)\right\} \\ &+ (t^a_y\,\overline{PI}_a - t^b_y\,\overline{PI}_b) \\ &+ PI^i\,(t^b_y - t^a_y). \end{aligned} \tag{5.4}$$

The first term, $\{\cdot\}$ is the one with which we are already familiar, and it provides justification for the equalization of source-based revenues across provinces. The last two lines represent the effect of personal or residence-based tax/expenditure structures, and they show the two types of benefits that result from residing in a province with high average levels of personal income. First, the terms $\overline{PI}_a$ and $\overline{PI}_b$ reflect the fact that a higher level of per capita provincial services can be financed at any given tax rate in a high-income province. To the extent that the high income province chooses to lower its tax rate, this advantage will be diminished. On the other hand, as is shown in the final term in PI^i, an individual at a given income level will benefit through lower tax payments if the fiscal advantage is exploited through lower taxes. If the two provinces levy the same personal income tax rates, the last term in equation 5.4 will disappear; thus an equalization program that would eliminate differences in tax collections of all types across provinces would enable horizontal equity to be achieved among individuals. The broad approach, therefore, calls for the full equalization of interprovincial differences in source-based and residence-based tax collections.

The narrow approach starts with the assumption that provincial residents have inherent property rights to the component of real income that arises from provincial taxes and expenditures. In the absence of redistributive behaviour by provincial governments, we saw in Chapter 3 that this called for an equalization program that would eliminate only a portion of the differences in source-based tax revenues, with the proportion determined as the federal marginal tax rate. Does the same hold true for the net fiscal benefits that result from the progressivity of provincial budgets, which in turn results from the expenditures financed out of residence-based taxes? We shall see now that it does not.

Using the expression given for an individual's real income in equation 5.3, we consider a resident of *A* and a resident of *B*, each having the same real income. Now,

$$\begin{aligned} PI_a + \frac{1}{L_a}(t^a_K r_a K_a + t^a_N s_a N_a) + t^a_y\,(\overline{PI}_a - PI^i_a) \\ = PI_b + \frac{1}{L_b}(t^b_K r_b K_b + t^b_N s_b N_b) \\ + t^b_y\,(\overline{PI}_b - PI^i_b). \end{aligned} \tag{5.5}$$

As in Chapter 3, we observe that unless the sum of all the net fiscal benefits is the same for each individual, their personal incomes will be different and hence they will receive different treatments under the federal tax/transfer system. The principles of horizontal and vertical equity will be violated. Under a federal tax/transfer system that is linear in personal incomes, the amount of equalization that is called for in respect of these two individuals is determined by:

$$g^i_a - g^i_b = x\left\{\frac{1}{L_a}(t^a_K r_a K_a + t^a_N s_a N_a) + t^a_y\,(\overline{PI}_a - PI^i_a) - \frac{1}{L_b}(t^b_K r_b K_b + t^b_N s_b N_b) - t^b_y\,(\overline{PI}_b - PI^i_b)\right\}, \tag{5.6}$$

where *x* is the average marginal federal income tax rate.

The total amount of the required equalization transfer required is then obtained by constructing such equations for individuals in all real income classes and requiring budget balance in the equalization program. Equalization can be thought to comprise two components. The first is equalization in respect of source-based tax revenues:

$$x\left\{\frac{1}{L_a}(t^a_K r_a K_a + t^a_N s_a N_a) - \frac{1}{L_b}(t^b_K r_b K_b + t^b_N s_b N_b)\right\}.$$

This, as we have seen already, turns out to require – for a linear, federal tax/transfer system – partial elimination of the differences in source-based taxes. The second component is equalization in respect of residence-based taxes:

$$x\left\{t_y^a\,(\overline{PI}_a - PI_a^i) - t_y^b\,(\overline{PI}_b - PI_b^i)\right\}.$$

It is obvious that there should be positive equalization in respect of low-income persons (i.e., those with income below the provincial average) in the poor province (low $\overline{PI}$ and negative equalization in respect of high-income persons (i.e., those with income above the provincial average) in the poor province. When the total amount of equalization in respect of residence-based taxes is calculated, it turns out to be zero. In the absence of direct transfers between individuals in the two provinces, a system with no interregional transfers in respect of residence-based taxes ensures the financial possibility of achieving horizontal and vertical equity under this assignment of property rights. Alternatively, if an equalization program involved transfers to individuals rather than provincial governments (e.g., if net fiscal benefits from provincial budgets were treated as taxable income), the total receipts of the low-income persons in the poor province would be equal to the payments by the high-income persons in the same province; the same would be true in the rich province. It is only the differences in per capita source-based tax revenues that would require some net interregional transfers. It should be emphasized once again, however, that any equalization program based on transfers to governments cannot guarantee the *actual* attainment of horizontal and vertical equity, but only the financial *possibility* of its attainment. If all provinces behave identically *ex post*, full horizontal equity will be achieved.

Rather than attempt to proceed any further with the general arguments concerning the equalization of residence-based tax revenues, it might be more instructive now to work through, in more detail, some examples of the kind provided near the end of Chapter 2.

Further Illustrations of the Equity Argument for Equalization of Residence-Based Taxes

In Chapter 2 we presented an example of two provinces, *A* and *B*, each having different proportions of rich and poor residents. Province *A* had two residents with personal incomes of $20,000 and one with a personal income of $10,000; province *B*, on the other hand, had only one with $20,000 and two with $10,000. With a 10 per cent income tax rate, province *A* could provide $5,000 worth of provincial services, which, if distributed equally among the three residents, would amount to $1,667 per person; province *B* could provide only $4,000, or $1,333 to each of the three residents. Taking provincial budgets into account, the high-income persons would have had real incomes of $19,667 in *A* and $19,333 in *B*. The corresponding figures for low-income persons would have been $10,667 in *A* and $10,333 in *B*. Thus the federal income tax system would systematically discriminate against persons in *B* unless something were done to correct it.

Suppose the view were taken that the federal government ought to achieve horizontal and vertical equity with respect to income levels calculated prior to the effects of government budgets, i.e., suppose it wanted to remove the discrepancy by eliminating interprovincial differences in net fiscal benefits from provincial budgets. Then, in this example, the sum of the per capita fiscal advantages to residing in *A* would be $333 x 3, or $1,000. Notice that this is exactly the difference in aggregate income tax collections (just as $333 is the difference in per capita tax collections). The federal government could equalize per capita tax collections by redistributing $500 from *A* to *B*. If the federal government did this and if the provinces responded by keeping their tax rates at 10 per cent while varying their expenditures, the end result would be that all persons would receive the same per capita benefits from provincial spending across the nation and each person in a given income group would pay the same taxes regardless of where he/she resided. In particular, the per capita benefits would be $1,500 in provinces *A* and *B*. The high-income persons would receive net benefits from the province of $1,500 – $2,000 = –$500, while the low-income would receive $1,500 –$1,000 = +$500. The fiscal residuum differential would have been removed, and the federal government could then proceed with the task of achieving equity via their income tax system. (They would, of course, have to take into consideration that some redistribution was already taking place through provincial taxes and spending.)

One noteworthy characteristic of the above result is that it is exactly what would have been achieved had the government been a unitary one instead of a federal one and had it pursued a nationwide policy of taxing at 10 per cent and spending the proceeds on the provision of uniform public services to all residents. This highlights the point that in order for the above result to be achieved with equalization payments in a federal system, the provinces would have to behave in a particular way; in the above example, they would have to use the proceeds of their equalization payments to provide the same public services at the same tax rate as their neighbouring provinces. Only if they did so would fiscal residues actually be eliminated.[2] This again emphasizes the point that any scheme that we might advocate could (at best) only *make it possible* to achieve full horizontal and vertical equity; it could not actually achieve it.

We could have started the above example from a different point and obtained the same result, provided once again that the provinces agreed with the nationwide norms for redistribution. For example, suppose that all provinces provided $1,500 worth of public services in the absence of equalization and selected the rate of proportional tax that would suffice to finance that amount. In this case, province *A* would require a tax rate of (1,500 x 3) ÷ 50,000 x 100 per cent, or 9 per cent. Province *B*'s tax rate would be (1,500 x 3) ÷ 40,000 x 100 per cent, or 11 per cent. All persons would be better off in *A* than in *B*, and the fiscal residuum would be the same proportion of total income (2 per cent) for all. In this case, the fiscal residuum differentials could be eliminated by transferring the same amount ($500) from *A* to *B*, provided once again that the provinces provide the same level of public services *ex post*.

An interesting feature of the above scheme is the formula for the equalization payment. In both cases $500 is the amount of the transfer from the high- to the low-income province. In the former example, that is one-half the fiscal residuum differential in aggregate; in the latter case, it is not. Nonetheless, in either case we can calculate the amount of equalization transfer that is owing by computing the national average tax rate, applying it to the provincial tax bases, and finding out how much the province would collect in taxes using the national average tax rate. The province's entitlement is then the difference between what the province would get by applying national average tax rates to its base and what it would get by applying national average tax rates to the national average tax base. This is exactly the present equalization formula! It can thus be seen to be justified on equity grounds under the simple assumptions of the example we have used in this section.[3]

We should re-emphasize at this point that the case for equalization of residence-based taxes depends not only on the particular assumptions we have made about the progressivity of provincial fiscal structures, but also on the value judgment that individuals do not have inherent property rights to components of real income that arise from the fiscal benefits of living in a rich province. If we assume that such property rights should be recognized, then, as we saw earlier, no interprovincial equalization is called for in respect of residence-based taxes. If net fiscal benefits from residence-based taxes were included in the taxable incomes of individuals, the total receipts attributable to the rich in each province because of this correction (for their negative NFB's) would be exactly equal to the payments required from the poor (as a result of their positive NFB's).

It is a straightforward matter to generalize the above results for more complicated cases. They would continue to hold if there were many income groups, many provinces, and different numbers of persons in each province, and if income distributions before redistribution took any arbitrary form over the provinces. In other words, an equalization scheme that would bring all provinces to the national average in per capita tax capacities would suffice for the pursuit of federal vertical equity provided that all provinces agreed to a common norm of redistribution and provided their redistributive policies could be characterized as taxing residents on a proportional basis and that benefits were on an equal per capita basis. The indirect taxes could be included in this part of the formula if their costs were borne by the residents of the province. Recall that this would require that they be shifted fully forward in higher prices to residents and not be borne by nonresidents.

Perhaps another example will serve to illustrate the generalization of the basic proposition. The first example has now been amended to include three provinces, three income groups, and three sample populations. Table 5-1 compares three provinces: *A* (rich), *B* (average), and *C* (poor), each having different income distributions and sample populations. Province *C* has the largest population, while *B* has the lowest. Let us suppose we start out with the simple case in which all provinces levy a 10 per cent tax and use the proceeds to finance a uniform level of public services for their residents.[4] The per capita public services in *A*, *B*, and *C* will be worth $2,375, $2,143, and $1,667, respectively. The net benefits to the residents in each province as a result of provincial government activity are as shown. The fiscal residuum differentials are identical for each income group and are shown in the table.

Consider now the following equalization scheme based on the existing national average one and applied to the income tax base. The national average tax rate is 10 per cent. Applied to total national income it yields 0.1 x $540,000, or $54,000. On a per capita basis this amounts to $54,000 ÷ 27, or $2,000. We have already seen that the national average tax rate of 10 per cent applied to actual provincial incomes yields per capita taxes of $2,375, $2,143, and $1,667 in *A*, *B*, and *C*, respectively;

Table 5-1

The Need for Equalization of Residence-Based Taxes: A Hypothetical Comparison between Provinces

	Province		
	A	*B*	*C*
Number of persons with:			
$30,000 income	4	3	2
$20,000 income	3	2	4
$10,000 income	1	2	6
Total sample population	8	7	12
		(Dollars)	
Aggregate income	190,000	150,000	200,000
Per capita income	23,750	21,430	16,667
Net gain from provincial budget:			
$30,000 resident	-625	-857	-1,333
$20,000 resident	375	143	-333
$10,000 resident	1,375	1,143	667
Fiscal residuum relative to *A*	0	-232	-708
Per capita equalization entitlement under present program	-375	-143	333
Aggregate equalization entitlement	-3,000	-1,000	4,000
Additional per capita equalization needed	-200	16	123

therefore the per capita equalization entitlements will be –$375, –$143, and $333. As Table 5-1 shows, this corresponds to total entitlements of –$3,000, –$1,000 and $4,000. Two things are noteworthy about this result. The first is that the equalization scheme is self-financing, as it must be. The second is that once these equalization payments are made, all provinces will be able to provide the same level of public services per capita ($2,000) at the same tax rate of 10 per cent. Once again, it will be just as if the state were a unitary one, with the federal government collecting a flat tax rate of 10 per cent to finance the uniform provision of local services.

In the presence of this equalization scheme and assuming uniform provincial behaviour as posited, the fiscal residuum differentials will be eliminated. The federal government will then be in a position to pursue the extent of vertical equity it desires by undertaking as much additional redistribution as it requires. The federal personal income tax will be perfectly adequate for the task once the equalization scheme is in place; however, equalization is necessary in order to achieve full nationwide vertical and horizontal equity.

We can also use this example to indicate the inadequacy of the existing gross equalization scheme for eliminating NFB differences among provinces. Suppose the federal government were to attempt to provide $333 per capita to province *C* to eliminate that NFB, and suppose it were to finance it using a nationwide proportional tax. This is a stylized view of how the present system works. It would require a tax of 0.74 per cent to be levied on all persons to finance such a transfer. This would mean per capita tax payments of $175.75 in *A*, $158.58 in *B*, and $123.34 in *C*. As indicated at the bottom of Table 5-1, this would only go part way to eliminating NFB differences. Considerable differentials would still exist that a gross scheme could not capture. Naturally, this particular example is suggestive only, since the relative magnitudes involved would be specific to the example under consideration.

The above examples were designed to make the case for equalizing residence-based taxes (i.e., personal income tax and indirect taxes) in the strongest possible way. It relies on provinces to behave in a particular way – the amount of redistribution must be equivalent to that obtained when provincial taxes are proportionate and benefits are uniform per capita. Finally, we have implicitly ignored efficiency issues by assuming labour immobility over provinces. The remainder of this chapter will be concerned with the consequences with regard to equalizing residence-based taxes of relaxing these assumptions. It should be stressed that none of these arguments bear upon the desirability of equalizing source-based taxes; the issue is whether, in addition, residence-based taxes should be equalized.

Relaxing the Assumptions about Provincial Redistributive Behaviour

The above case for equalizing residence-based tax capacities to the national average depended upon a particular pattern of redistribution implicit in the tax and spending policies of provincial governments. In this section we investigate the effects of alternative assumptions about the pattern of redistribution that is implicit in government policies. Then we shall consider briefly what happens when provinces disagree with one another over vertical equity.

Alternative Assumptions about the Progressivity of Provincial Budgets

Until now we have assumed that provinces all undertake similar amounts of redistribution through taxation that is proportional to income and through benefits that are uniform per capita. We now investigate other alternatives.

As noted already in Chapters 2 to 4, when provincial budgets are distributionally neutral, no equalization of residence-based taxes is called for; only source-based taxes should be equalized. The argument is straightforward. Under neutral provincial budget policies vis-à-vis residence-based taxation, tax payments for each person in the province are equal to the value of provincial public services provided. No net fiscal benefits or differentials are created therein in respect of residence-based taxes, and the taxable income used in the federal tax base is a perfectly satisfactory base for vertical and horizontal equity, independent of province of residence (provided source-based taxes have already been equalized). This simple case shows how critical it is to know how redistributive a provincial budget is; the case for equalizing residence-based taxation depends very much on the overall progressivity of provincial budgets. The importance of this point will become even more evident in the following example.

Provincial Budgets Are Regressive

Let us suppose that the tax and spending policies of provincial governments redistribute real income from low- to high-income persons. A numerical example will illustrate that in this case equalization should also be regressive; i.e., it should go from low-income to high-income provinces! Let us revert to the example of the three provinces and three income groups in Table 5-1. Now, however, let us assume that provinces raise taxes in equal per capita amounts but provide benefits that are proportional to income. For simplicity, suppose that benefits are 10 per cent of income and that per capita taxes in the three provinces are set so as just to finance these benefits. It is, in fact, almost a mirror image of what took place in Table 5-1. Per capita taxes in provinces *A*, *B*, and *C* will be $2,375, $2,143, and $1,667, respectively. The net benefits to each income group will be of identical magnitude but opposite sign to those shown in Table 5-1. Each person in province *B* will be better off by $232 than his counterpart in *A*, while those in *C* will go from the poorest to the richest in this case. The amount of equalization that each province is entitled to receive will be the negative of those items shown in the table.

What is happening here is that instead of equalizing the ability to raise a given amount of taxes, the scheme is equalizing the ability to provide benefits based on income. To do so requires transfers from low-income to high-income persons. Provided that provinces all behave according to a uniform norm of vertical equity, all provinces will be able to provide the same benefits to each income group at identical per capita tax rates. The federal government can then undertake whatever redistribution it wishes through the income tax to achieve vertical and horizontal equity nationwide. This special example illustrates the general point that if provincial budgets are regressive, equalization of residence-based taxes should go from low-income to high-income provinces.

A redistributive pattern in a provincial budget that is regressive overall could also be achieved with equal per capita public services and a sufficiently regressive income tax system. If the tax system is sufficiently regressive, it will collect more money from poor persons than from rich persons. Therefore the per capita level of public services available will actually be higher in a low-income province than in a high-income province. This helps to explain why equalization would have to be paid from low-income to high-income provinces in this case.

Provincial Taxes Are Progressive; Benefits Are Uniform

Both cases considered so far were examples in which provincial budgets were less progressive overall than the one considered in the second and third sections. Let us now consider the case in which budgets are more progressive than the latter. The example we consider is not too farfetched when considered against the current Canadian case. Because of the tax collection agreements, all provinces except Quebec have tax rates on personal income that are tied to those of the federal government. These are progressive tax rates. Let us assume that the provinces all raise revenues from taxes that are progressive with respect to income levels. These tax revenues are then used by them to provide uniform per capita benefits to their citizens. The population and income distributions will be taken to be the same as those in Table 5-1. The relevant details are reproduced in Table 5-2.

Suppose that the progressivity of provincial income taxes is such that average tax rates rise linearly with income levels and that all provinces levy the same tax rates. In particular, the average tax rates are 10 per cent on incomes of $10,000, 20 per cent on $20,000, and 30 per cent on $30,000. This implies tax payments of $500, $2,000, and $4,500 by the three income groups. Total taxes collected in each province and total per capita benefits are depicted in the table. Naturally, province *A* has the highest per capita benefit, while *C* has the lowest. The net benefits to each income group from provincial government activity are also shown in the table. These calculations show that the net fiscal benefits differential between provinces is identical for each income group. This is because we have set up the example

Table 5-2

Equalization of Residence-Based Taxes: A Hypothetical Comparison of Payments under the Existing Program and an Ideal Program

	Province		
	A	*B*	*C*
Number of persons with:			
$30,000 income	4	3	2
$20,000 income	3	2	4
$10,000 income	1	2	6
		(Dollars)	
Total income (tax base)	190,000	150,000	200,000
Per capita income	23,750	21,430	16,667
Taxes collected	24,500	18,500	20,000
Per capita taxes (benefits)	3,063	2,643	1,667
Net benefits from provincial government:			
$30,000 resident	-1,437	-1,857	-2,833
$20,000 resident	1,063	643	-333
$10,000 resident	2,563	2,143	1,167
Fiscal residuum relative to *A*	0	-420	-1,396
Per capita equalization under ideal program	-730	-310	667
Per capita equalization under existing program*	-438	-167	388

*Assumes existing program applies to both the "have" and "have not" provinces symmetrically.

so that all provinces have the same tax rates but different benefit levels. We could have alternatively set up the example so that initially provinces would provide the same level of benefits at different tax rates, and net fiscal benefit differentials would have varied over income groups. Provided that provinces all conform *ex post* when equalization payments have been made, the starting point has no bearing on the arguments in this section.

The simplest way to determine appropriate equalization entitlements in this example is to imagine what the per capita benefits would be under a unitary system of government at existing tax rates. Over the nation as a whole, the total tax collection by the provinces is $63,000. If this were distributed uniformly throughout the nation, per capita benefits would be $63,000 ÷ 27, or $2,333. The per capita equalization payments that will enable the three provinces to provide exactly this amount to each resident using the same tax rate for all citizens are shown in the table as –$730, –$310, and $667 for *A*, *B*, and *C*, respectively. A simple check will show that these sums net to zero on an aggregate basis. This amounts to a transfer from higher-income to lower-income provinces.

Let us now determine what equalization entitlements would have been forthcoming had we applied the equalization formula that is now in use. We have already seen that this formula is appropriate for the example considered earlier – namely, proportional taxation and uniform benefits. The national average tax rate is easily computed to be $63,000 ÷ $540,000 x 100 per cent, or 11-2/3 per cent. Applying this national average tax rate to the per capita income levels in each province would yield tax revenues of $2,771, $2,500, and $1,945 in *A*, *B*, and *C*. Comparing these with per capita national tax revenues of $2,333, we calculate the provincial per capita equalization entitlements for *A*, *B*, and *C* to be –$438, –$167, and $388, as shown in Table 5-2. In other words, the existing equalization formula would provide too little interprovincial redistribution if provincial budgets were more progressive than the standard case of proportional taxation and uniform benefits. Once again, the appropriate amount of equalization of residence-based taxation, if any, would depend upon the empirical question of the overall progressivity of provincial budgets. Any actual equalization scheme must, at least implicitly, make a judgment in that regard. The reason that more equalization is called for in this case than in the proportional-tax/uniform-benefits case is that a progressive tax system will raise more revenues per capita in a high-income than in a low-income province.

While we have limited ourselves mainly to cases where the benefit structure is uniform, it is clear that an appropriate equalization scheme can always be devised for any redistributive patterns that provinces choose to provide, regardless of the progressivity of the benefit side, provided as always that provinces act in a common way *ex post*. What the exact equalization formula will look like will depend upon the exact nature and progressivity of the provincial budget. There is only one case in which it will equalize the tax capacities of the residence-based taxes of all provinces to the national average. The more (less) progressive the provincial fiscal structures, the higher (lower) the amount of equalization of residence-based taxes warranted.

At this point, it is worth pausing to consider another method of equalization suggested by this last example. The schemes considered so far are referred to in the literature as *net* schemes. They are characterized by the fact that they are self-financing: the amounts received by recipient provinces are exactly the same as the amounts owing by donor provinces. Suppose, however, that the rate structure of provincial income taxes is tied to the federal structure. Also, suppose that provinces provide uniform per capita benefits to their residents with tax revenues. Then an alternative way to achieve the desired amount of equalization would be for the federal government to operate a gross scheme similar to the following. The provincial share of income taxes is collected by the federal government, which then turns over the proceeds of the aggregate provincial share to the provinces on an equal per capita basis. This, curiously enough, is similar to the way in which the early postwar tax rental arrangements operated. It turns out that it is a perfect equalization scheme for the income tax under the postulated circumstances.

Notice that the recently negotiated Established Programs Financing (EPF) scheme is also basically of that sort. It is a method of redistributing tax revenues from the federal government to the provinces on what is roughly an equal per capita basis.[5] Since these transfers are financed out of federal tax revenues and since the latter are presumably raised in a manner that is likely to be proportional to, or progressive with respect to, income (e.g., personal income tax), the EPF scheme overall redistributes income from high-income provinces to low-income provinces. It would be a mistake, however, to attribute much of an equalizing role to the EPF system. The coexistence of the equalization scheme and the EPF scheme renders the latter virtually impotent as a redistributive device. To see this, consider the following hypothetical experiment. Assume that the federal government abolishes EPF transfers and turns over to the provinces just enough personal income tax points to leave its budget position unaffected. If the equalization scheme were a net scheme, the financial position of each of the provinces would be unaffected because the equalization of the tax points turned over to the provinces would effectively leave the provinces with equal per capita tax revenues as a result of receiving the equalized tax points. This would just offset the loss in EPF transfers and would leave them neither better nor worse off. Because the equalization scheme is gross rather than net, only the tax points turned over to the seven have-not provinces would be equalized. This implies that the high-income provinces would gain slightly relative to the low-income provinces from the process of abolishing EPF and turning over tax points. The overall effect of EPF, however, is by no means as redistributive as it might appear at first sight.

Finally, it should be stressed that the analysis of this section has proceeded on the assumption that provinces behave in a uniform manner. That is, faced with the same tax capacities, they would provide the same level of public services, using the same progressivity of tax structure. As a first approximation, this is probably not far from the truth. The personal and corporate tax structures are more or less similar owing to the tax collection agreements. Furthermore, being small economies in a world of mobile labour and capital, the extent to which provinces can pursue widely differing policies of redistribution is fairly limited. Nonetheless, provinces may well behave differently with respect to the absolute size of their public sectors even if they are more or less similar with regard to the degree of redistribution. If that is the case, an equalization scheme based upon national average tax rates cannot possibly achieve full horizontal equity regardless of what notion of equity one prefers. To devise a scheme that is perfectly equitable from a nationwide point of view would implicitly involve treating each province in a particular way and would have the effect of overriding provincial differences in either redistribution or levels of budgetary activity. In other words, it would amount to the federal government imposing upon the provinces its own norms of equity and behaviour. Apart from the unfeasibility of such a scheme, it strikes us as being contrary to the spirit of the Canadian federation. It would seem sensible to base equalization on the national average behaviour of provinces and allow them to deviate at their own expense if they so wished. The equalization scheme would do no more than make it possible for the provinces to conform to the federal view of equity and efficiency; it would not compel them to do so. To put it succintly, an equalization scheme based on national averages is a necessary, though not sufficient, condition for achieving nationwide equity and efficiency.

The Efficiency Case for Equalizing Residence-Based Taxes

The general efficiency argument for equalization payments was outlined in Chapter 3 for the case of source-based taxes. Mobile factors of production move between provinces in response to differences in material rewards. These rewards include both market incomes, which are related to marginal-value products in a competitive economy, and net fiscal benefits from provincial budgets. In the presence of differences in these net fiscal benefits, migration equilibrium will result in interprovincial differences in the marginal-value products of mobile factors of production. In the absence of offsetting distortions, such an equilibrium is inefficient. Efficiency in the interregional allocation of mobile resources can be achieved by an equalization program that will eliminate interprovincial differences in net fiscal benefits from provincial budgets. Under the assumptions in Chapter 3, it was only the source-based taxes that could create net fiscal benefits. In earlier sections of the current chapter we saw that under non-neutral provincial budgets (i.e., those which systematically redistribute income between different income groups) residence-based taxes also give rise to interprovincial differences in net fiscal benefits. Using the same argument as in Chapter 3, therefore, an equalization program that would have the effect of eliminating these differences would increase the efficiency of the interprovincial allocation of mobile factors of production.

The argument can be illustrated as follows. Suppose that labour is the only mobile factor; that provinces achieve a progressive fiscal structure by raising revenues from source-based taxes and from proportional personal income taxes; and that provincial services are distributed on an equal per capita basis to provincial residents. Then the real income of a resident in province *A* can be expressed in the form of equation 5.3 above; a similar expression will hold for someone residing in *B*. In the absence of migration costs, workers will move between *A* and *B* whenever they can increase their real incomes by doing so. Therefore a migration equilibrium for any individual, *i*, can be characterized as:

$$\begin{aligned} &PI_a^i + t_Y^a(\overline{PI}_a - PI_a^i) + 1/L_a(t_K^a r_a K_a + t_N^a s_a N_a) + g_a \\ &\quad = PI_b^i + t_Y^b(\overline{PI}_b - PI_b^i) + 1/L_b(t_K^b r_b K_b + t_N^b s_b N_b) + g_b, \qquad (5.7) \end{aligned}$$

where g_a and g_b are the yet-to-be-determined equalization payments (one negative; the other positive). Since his pre-tax personal property income (i.e., income from ownership of capital and land) will be independent of where he resides, equation 5.7 can be rewritten as:

$$\begin{aligned} &W_a^i + t_Y^a(\overline{PI}_a - PI_a^i) + 1/L_a(t_K^a r_a K_a + t_N^a s_a N_a) + g_a \\ &\quad = W_b^i + t_Y^b(\overline{PI}_b - PI_b^i) + 1/L_b(t_K^b r_b K_b + t_N^b s_b N_b) + g_b. \qquad (5.8) \end{aligned}$$

Efficient interregional allocation of labour requires equality in the value of the marginal product of labour between provinces; hence $W_a^i = W_b^i$. Taking into consideration this required interprovincial equality in wages, we use equation 5.8 to solve for efficient equalization transfers:

$$g_b - g_a = \left\{t_Y^a(\overline{PI}_a - PI_a^i) + 1/L_a(t_K^a r_a K_a + t_N^a s_a N_a)\right\} - \left\{t_Y^b(\overline{PI}_b - PI_b^i) + 1/L_b(t_K^b r_b K_b + t_N^b s_b N_b)\right\}. \qquad (5.9)$$

where $L_a g_a + L_b g_b = 0$ for budget balance. The important thing to observe is that this is exactly the equalization program that was called for in the same circumstances on broad equity grounds under the ethical/constitutional assumption that provincial residents have no inherent property rights to real incomes that arise from provincial net fiscal benefits. While capital mobility will create the same problems as it did in other examples and the introduction of migration costs will also pose some difficulties, the general conclusion remains that the equalization program called for on equity grounds closely resembles that called for on efficiency grounds, at least under certain property-right assignments. As before, under other assignments of property right, the amount of equalization called for on efficiency grounds will exceed that called for on equity grounds.

Finally, it is worth emphasizing once again that, just as in the case of our equity arguments for equalization, all that such a programme can do is *make it financially possible* to achieve a policy objective – in this case, economic efficiency. If the recipient province were to use its equalization entitlement to reduce the tax rates for upper-income groups only and if the paying province were to raise the additional taxes from the same income groups, there would still be a net fiscal incentive for the rich to migrate to the recipient province and for the poor to move in the opposite direction. Efficiency would not be achieved. On the other hand, in the absence of such an equalization program, it would generally be impossible to achieve an efficient interregional allocation of mobile factors of production. Unless an equalization program was designed in such a way as to veto any undesirable provincial spending or taxing decisions, it could not guarantee the actual attainment of either equity or efficiency; it could only make the attainment of these goals financially possible.

6 Conclusions

The purpose of this study has been to examine the basis for an equalization program. Before doing such an evaluation, it was necessary to begin with some basic principles. We have acknowledged the general political framework of Canada's federal system and the need to take into consideration the nature of the economic functions performed by each level of government. In evaluating the merits of alternate government policies and programs, however, we have taken the view that it is their impact on the well-being of individuals and households that is of ultimate importance. We are interested in the economic welfare of individuals, not of governments. Two of our most important criteria have been efficiency and equity. We are concerned with improving economic efficiency in order to increase the standard of living of all Canadians on an individual basis. Our concern with equity is related to the twin desires of: 1/ reducing the inequalities in real income between individuals (vertical equity), and 2/ ensuring that similar persons are treated in similar fashion by government policies (horizontal equity). These goals seem to have broad support in Canada and have formed the basis of policy recommendations by many bodies besides the Council (e.g., the Carter Commission).

Given these as our policy goals, we ask the following fundamental question. Why do we need an intergovernmental transfer system when we have in place, at both levels of government, a well-established tax/transfer system among individuals, households, and firms for regulating the allocation of economic activity and the distribution of its fruits? In other words, what can (or should) be accomplished through a system of intergovernmental transfers that could not be accomplished through the tax/transfer system among individuals?

Summary of Main Results

Our analysis, which is summarized as follows, has led us to conclude that there is an important role to be played by a program of equalization grants in our federal system. This is so, regardless of whether our principal concern is equity or economic efficiency. The form and the amount of equalization called for, however, will depend very much on the assumptions about institutional arrangements and underlying economic mechanisms. While many of these assumptions are based on questions that can, at least in principle, be resolved by empirical analysis, *some of them hinge on judgments about the constitutional nature of, or ethical grounds for, the allocation of certain property rights in the Canadian federal system.*

We have demonstrated how the exact nature of the desired equalization program depends on such assumptions. Generally it turns out that the form of the equalization program that is called for will be the same whether we are concerned with equity or efficiency. In some cases, however, the amount of equalization that is required will depend on which of these criteria is more important.

The basis of the case for equalization payments lies in the fact that in a federal system such as Canada's, the market incomes of individuals do not totally reflect the real incomes of persons living in different provinces. Provincial fiscal activities give rise to real income differences that are not reflected in the personal incomes of individuals. Since equity requires that governments concern themselves with the comprehensive incomes of individuals and since the current tax/transfer system is based primarily on pesonal market incomes, an additional redistributive transfer system that deals with differences in net fiscal benefits from provincial government activities is called for. The same turns out to be true on efficiency grounds.

How is a person's real income affected by provincial government activities? Provincial governments provide goods and services to individuals, regulate the provincial economies, and finance these activities by levying taxes. The difference between the benefits that a resident receives from provincial activities and the costs that he bears can be termed that resident's net fiscal benefits (NFB's) from the provincial budget. For a variety of reasons it is highly unlikely that all residents of all provinces will have zero NFB's, and it is also unlikely that persons in a given income class will have the same NFB's regardless of the province in which they live. For instance, residents of provinces that are able to raise substantial natural resource revenues will be likely to have higher NFB's than residents of resource-poor provinces. Similarly, if provincial governments were to engage in tax/expenditure policies that tended to redistribute income from rich to poor, lower-income persons would tend to have positive NFB's, and the size of these NFB's would be higher for the poor residents of high-income provinces than for those of low-income provinces.

Without elaborating any further at the moment on the determinants of NFB's from provincial budgets, we shall go on to summarize the equity and efficiency arguments for equalization on the assumption that interprovincial differences in NFB's do exist. In a later section we shall discuss the major sources of these interprovincial differences in Canada.

Equity Arguments for Equalization

The total real income of a person (before federal taxes and transfers) in a particular province is calculated as the sum of his/her pre-tax personal market income from wages and property, plus the NFB's he/she derives from provincial activities.

Consider, first, the case in which all provincial residents receive zero NFB's, in other words, the taxes paid by each person are equal to the share of the benefits received from provincial government activities. In such circumstances, provincial expenditures are, in effect, payments from provincial residents back to themselves, and they do not yield a net increase in real income. Therefore, the real income of a resident of any province is simply his/her pre-tax personal market income; no fiscal benefit is generated, and horizontal equity and the desired degree of vertical equity are preserved by an appropriate system of taxation and expenditures based on personal market incomes. Persons in similar positions with respect to incomes but residing in different provinces would be treated equally by provincial and federal governments, and the desired differences in the treatment of individuals with different incomes would be maintained. There would be no need for any regionally discriminatory fiscal measures such as equalization.

Now let us consider the more interesting case where the NFB's of individuals are not zero and interprovincial differences in NFB's do result from residing in different provinces. In this case, equity considerations will be violated by a federal tax/transfer system based solely on personal market incomes. Horizontal equity will not be achieved, since persons with identical real incomes (including NFB's from provincial budgets) will be treated differently under such a tax/transfer system. Nor will such a tax system produce vertical equity in the country as a whole. NFB's (whether positive or negative) constitute a source of income for provincial residents that is not part of taxable income for federal tax purposes. Hence even if the federal tax system does, in principle, embody the desired amount of vertical equity, such equity will not be achieved because one important source of personal income is not taken into account by the federal tax system.

What is required to solve these problems is some form of regionally discriminatory policy. This is so, because a person's real income depends not only on his/her market income but also on the province in which he/she resides. The two main types of instrument that might be considered are interpersonal transfers and intergovernmental transfers. The interpersonal transfer system could be adjusted as follows: 1/ an imputation could be added to the federal taxable income of each taxpayer for the NFB's received from the provincial budget; 2/ the federal income tax rate could be adjusted for each taxpayer to take into account the NFB's received; or 3/ the federal tax schedule could be adjusted so as to charge different tax rates in each province, depending on the interprovincial differences in the average level of NFB's in the province. On the other hand, a system of intergovernmental grants could be devised that would provide transfers to provincial governments, the net value of which would be positive in provinces whose residents have relatively low per capita NFB's and negative in provinces with high NFB's. The latter, of course, describes an equalization program.

Why use a system of intergovernmental rather than interpersonal transfers? First, to calculate NFB's on an individual taxpayer basis would be very difficult, costly, and controversial. Second, and more important, to implement an interpersonal rather than an intergovernmental equalization program could amount to the federal government overriding all redistribution decisions of provincial governments. In the Canadian federal system, federal and provincial governments jointly determine the extent of redistribution through the public sector; this is inherent in the distribution of tax and expenditure responsibilities between levels of government. To deny this would be practically to destroy the nature of the Canadian federal system of government. Since we do not advocate such changes in the Canadian system of government, we conclude that intergovernmental transfers are the only acceptable vehicle for remedying the equity problems that arise from interprovincial differences in NFB's from provincial budgets. It is inevitable that some conflict will arise between the redistributive actions of the provinces and that of the federal government. The compromise we advocate here, and one that is also implicit in the present equalization program, is for the federal government to equalize in such a way as to *make it financially possible* to achieve full horizontal and vertical equity for all individuals. But the provinces must be permitted to redistribute their own tax revenues as they see fit.

Having presented the case for the use of intergovernmental transfers, we shall now see that there are still two fundamentally different approaches to solving these equity problems, each one depending on a different view of horizontal equity. We shall, first, describe these two views about horizontal equity and then present the solutions that corresponds to each of them. The broad view consists in having a fiscal system nationwide that is horizontally equitable vis-à-vis the actions of all governments, federal and provincial. According to this view, two persons who are equally well-off *before provincial and federal government actions* must also be so afterwards. To institute a federal tax system that will ensure horizontal equity in the broad sense, the federal government must account for the nationwide horizontal inequities that are introduced by the independent behaviour of the provinces and make it possible to offset the fact that some persons end up being better-off in one particular province than their otherwise identical counterparts elsewhere. The narrow view of horizontal equity is that the federal government should take as a starting point the level of real income attained by individuals after provincial fiscal systems are in place. In this case, the federal government need only be concerned with ensuring that two persons who are equally well-off *after provincial government budgets* are in place are just as well-off in the presence of both provincial and federal budgets. The federal budget need not be concerned with offsetting the nationwide horizontal inequities that are introduced by provincial governments.

One way to view this distinction is in terms of the property rights or endowments of provincial citizens. Indeed, all applications of horizontal equity require one to stipulate an initial position against which comparisons can be made. If different provinces provide identical citizens with different net real income benefits as a result of provincial activity and if one wished to accord full property rights to individuals over such benefits, based on province of residence only, then the federal government should take the post-provincial-government position as the starting point for horizontal equity. If, however, one did not wish to assign such property rights on the basis of residency, the initial position for horizontal equity purposes should be that which would prevail in the absence of all government fiscal activity, including that of the provinces. It turns out that both views call for some sort of equalization on equity grounds, but of widely differing types and amounts.

One solution, then, would call for the complete elimination of differences in NFB's. The equalization program would eliminate all interprovincial differences in aggregate per capita NFB's. Only when the NFB's of individuals with the same market incomes are fully equalized will similar individuals (before provincial and federal government actions) be treated equally according to the broad view of horizontal equity.

The second solution, which is equivalent to treating the NFB's from redistributive provincial activities as taxable by the federal government, would turn out to require a much smaller reduction of per capita differences in residence-based tax revenues. There are two reasons for this. First, it is only a portion of the differences in aggregate per capita NFB's that we would want to eliminate. The proportion would be determined by the average marginal federal tax rate in the province. This would have the desired effect in that it would be equivalent to adding to (subtracting from) personal incomes in each province an imputation for the amount by which all residents benefited (suffered) as a result of residing in a province where they received above (below) average NFB's and taxing this just like any other form of income. Second, to the extent that differences in the NFB's of individuals arise from redistributive provincial budgets, the positive NFB's of the poorer residents would tend to cancel out the negative NFB's of the richer residents when the total amount of equalization was calculated.

How does one choose between these two different approaches to horizontal equity and the equalization programs that correspond to them? Since what is at issue is a question of property rights, it is necessary to look to ethical or legal arguments. While we can find little ethical justification for assigning individuals property rights to income in the form of fiscal benefits from government activities in the province in which they happen to reside, we recognize that the BNA Act could be interpreted as assigning such rights in certain cases. Therefore, before we can draw any general conclusions, it will be necessary to elaborate on the major sources of interprovincial differences in NFB's.

Major Sources of Differences in Net Fiscal Benefits

The net fiscal benefits that a resident derives from his/her provincial government have been defined as the difference between the benefits received from provincial expenditures and regulatory activities and the taxes that he/she pays. Taxes can be divided broadly into two types: 1/ those levied on the incomes received or the expenditures made by the residents of the province (e.g., personal income tax); and 2/ those levied on income or wealth at its source, regardless of the place of residence of the ultimate recipient of the income (e.g., corporate income taxes, property taxes, and resource taxes). We call the former taxes residence-based taxes and the latter source-based taxes. We shall look, in turn, at the effects that these two sets of taxes can have with respect to equity considerations and deduce the implications regarding equalization payments.

Residence-Based Taxes

Suppose that all provincial expenditures were financed by residence-based taxes. Then the NFB of any individual from provincial fiscal activities would be the value of the benefits he/she derived from provincial expenditures on his/her behalf less the provincial taxes on his/her personal income.

If the provincial budgets are distributively neutral, the amount of residence-based taxes paid by an individual will be equal to the share of the benefits received from provincial government goods and services; the real income of a resident of a particular province is simply his/her pre-tax personal market income. Thus when the activities of provincial governments are distributively neutral (i.e., publicly provided goods and services are financed according to the benefit taxation rule), no fiscal benefit is generated. In these circumstances no interprovincial differences in NFB's will emerge, and there will be no equity basis for equalization in respect of differences between provinces with respect to residence-based tax collections.

Now let us move closer to reality by relaxing the assumption that provincial government budgets are distributionally neutral. The nature of a large proportion of the provincial government expenditures in Canada (those pertaining to health, education, and social welfare), in combination with the relationship between tax collections and personal income, is such that the provincial budgets overall are progressive in their distributional impact; that is, they redistribute income from the rich to the poor. This progressivity of the provincial budgets has two implications for the real income of a resident of any particular province. First, persons with above-average personal incomes in a province will suffer a net loss from this redistributive provincial activity because they contribute more in taxes than they receive in goods and services from the provincial governments. The opposite is true for persons with below-average incomes. Second, persons living in provinces with above-average per capita incomes will receive higher NFB's from provincial expenditures that are financed by residence-based taxes. To see this, consider the simple case in which provincial expenditures are distributed among local residents on a uniform per capita basis, while taxes are proportional to individual incomes. Proportional income taxes generate a greater per capita amount of tax revenue the higher the average income level. Since expenditures are assumed to be distributed on an equal per capita basis, this means that individuals at any given income level will receive greater NFB's on this account in a province with a high per capita personal income level. In general, the greater the overall progressivity of the provincial fiscal structures, the greater the variation in NFB's between the rich and poor in any given province and the greater the average difference in per capita NFB's between the high- and low-income provinces.

Since provincial budgets in Canada are generally progressive in nature, the resulting differences in NFB's give rise to the problems of horizontal and vertical equity described earlier. The nature of the equalization program that is called for in respect of residence-based taxes depends on which of the two different views of horizontal equity we begin with. If we accept the broad view that persons have no inherent property rights to the higher NFB's that they receive by virtue of the fact that they happen to reside in a high-income province, then we would want an equalization program that fully eliminated all interprovincial differences in such NFB's. As we have indicated, the size of these differences that arise from residence-based taxes depends on the progressivity of provincial budgets. If the degree of progressivity corresponded to the particular case in which taxes were proportional to income and expenditures were distributed to residents on a per capita basis, the desired equalization would be one that would equalize per capita residence-based tax collections across provinces. A less (more) progressive fiscal structure would call for less (more) interprovincial redistribution through equalization.

The narrow approach to horizontal equity, which we have already indicated is equivalent to treating the NFB's from these redistributive provincial activities as taxable by the federal government, would turn out to require little or no interprovincial equalization of per capita differences in residence-based tax revenues. This is because the positive NFB's received by the poor will cancel out the negative NFB's received by the rich in each province. The total amount of equalization called for on this account will be insignificant. This second solution to residence-based tax differences seems in our judgment, however, to have little ethical justification. We see little ethical (or constitutional) support for the view that residents of a province should have property rights to benefits that accrue to them simply because they happen to live in a province with a higher-than-average per capita income. Therefore, we conclude that with respect to residence-based taxes equity considerations would require full equalization of NFB's. Since we believe that the degree of progressivity of provincial budgets corresponds roughly to the special case described earlier (taxes proportional to income; expenditures distributed equally per capita), this would require complete equalization of per capita residence-based tax collections. For residence-based taxes, at least, this corresponds to the notion that all provinces should have the fiscal capacity to provide similar levels of services at similar rates of taxation.

We turn now to the role of source-based taxes in achieving horizontal and vertical equity.

Source-Based Taxes

Source-based taxes are levied on income or wealth in a province regardless of the place of residence of the ultimate owner. These include property taxes, corporation income taxes, and most revenues from natural resources. Allowing now for the existence of source-based taxes, the total real income of an individual in a particular province consists of his/her pre-tax personal market income from wages and property, less provincial taxes on his/her income, plus the benefits from his/her share of provincial expenditures financed from the total residence-based taxes *and from the total source-based taxes*. In order to concentrate on the effects of source-based taxes on the real income of individuals and the implications with regard to our equity goals, we shall assume that provincial governments are distributionally neutral with respect to the provision of goods and services financed by residence-based taxes. As noted above, this implies that there is no need for equalization on account of residence-based taxes. Relaxing this assumption would not, however, alter our conclusions about the form and amount of equalization of source-based taxes. For simplicity, we shall also assume that provincial government expenditures financed from source-based taxes are distributed on an equal per capita basis.

The simplest case of source-based taxes to come to mind is that of rents generated from the ownership of resource properties. If these properties are owned by nonresidents, the rents collected will represent an additional source of income for the province. If the properties are owned by residents, the property income of residents, and thus the federal tax base, will fall by an amount equivalent to the source-based taxes collected by the provincial government. In either case, the equity goals will not be achieved, since the federal income tax base will not adequately reflect the income available to residents for spending on private goods themselves or to be spent on their behalf by the provinces. Differences in the amount of source-based taxes collected across provinces constitute a source of interprovincial differences in net provincial fiscal benefits; and, again, some form of equalization will be required to correct this situation.

As in the case of residence-based taxes, there are two methods of incorporating the unaccounted-for sources of real income into federal redistribution policies, each method corresponding to one of the two views on horizontal equity discussed earlier.

According to the broad view of horizontal equity, we should simply use equalization to eliminate all interprovincial differences in NFB's from provincial activities. In this case, full equalization of all interprovincial differences in per capita source-based tax revenues would be required.

According to the narrow view of horizontal equity, we take as a starting point the position of individuals after provincial budgets are in place. Under this view, the solution would be to add to (subtract from) personal incomes in each province an imputation for the amount by which each resident benefited (suffered) as a result of residing in a province with above (below) average per capita source-based tax revenues and to tax this just like any other form of income. This could be accomplished by an interprovincial equalization program that equalized a sum equal to the marginal federal tax rate times the differences in per capita source-based tax revenues between provinces. Only a portion of the interprovincial differences in NFB's (the part that would be levied in taxes by the federal government) would be equalized under this scheme.

This form of equalization, prescribed under the narrow view of horizontal equity, has merit in that it corresponds to the view that residents of a province really should be regarded as the proper "owners" of resource rents. It will be preferred to the alternative full equalization scheme to the extent that one considers it ethically correct and/or constitutionally necessary to grant property rights to source-based tax revenues to the residents of the province in which the revenues accrue.

Other solutions between these two extremes are also possible. For instance, it might be decided that it is legitimate (for constitutional reasons) to grant provincial residents property rights to provincial government resource incomes but that it is not ethically defensible to recognize similar property rights to other source-based taxes (e.g., corporate income taxes). Then what would be called for would be partial equalization (with the proportion being determined by marginal federal tax rates) of the differences in per capita resource revenues and full equalization of per capita provincial revenues from other source-based taxes.

As will be seen below, however, only one of these solutions – the full elimination of differences in the NFB's that are derived from provincial public sector activities – will be consistent with economic efficiency. Under the narrow-based view of property rights, there will be conflict as to the amount of equalization that is called for on grounds of equity as opposed to economic efficiency.

Before turning to efficiency, however, we shall examine some other factors that affect the size and distribution of NFB's, factors that should be taken into account in the design of an equalization program.

Other Factors Related to the Size and Interprovincial Distribution of NFB's

We now refer briefly to the effects of certain considerations relevant to the Canadian federal system that have not been dealt with in our discussion to this point.

So far, we have assumed that all tax revenues in a province are used to finance the provision of goods and services for local residents. At least two other alternatives are possible. First, some expenditures may be used to provide social infrastructure or to cover other costs related to production in the province. To the extent that these expenditures result in higher profits or other benefits for nonresidents, they will not provide NFB's for domestic residents and hence should not be subject to equalization. Also, if such expenditures should result in higher wages or other forms of personal income for local residents, they will be reflected accurately in the base of the federal tax/transfer system (i.e., in personal market incomes) and thus need not be subject to equalization. Second, a provincial government may choose to invest a share of its tax revenues (from any source) in a savings fund and then use the interest on that fund to help finance current expenditures. In such a case it is only the portion of current tax revenues, plus interest, that is used to finance current expenditures (plus any depletion of the capital of the fund) that creates a current NFB to residents of the province; therefore, it is only this amount that should be subject to equalization. For instance, the oil and gas revenues in Alberta that are channeled directly into the Heritage Fund should not be subject to equalization; however, the income from the Fund that is not reinvested and the depletion of the capital should be subject to equalization.

Finally, there are some provincial government activities that do not show up in provincial revenues but yet create NFB's; these should be subject to equalization. One example is hydro-electricity that is sold to residents at less than full cost by provincial Crown corporations. This method of distributing hydro rents creates a real income for residents just as would a reduction in tax rates made possible by the profits that would accrue to the government under full-cost pricing. Since this form of real income does not appear in the base of the standard tax/transfer system, it is just like an NFB from provincial government activities, and equity considerations require that these rents be taken into account in an equalization program. This last issue has become, and will continue to be, particularly important in current debates over the nature of federal-provincial fiscal arrangements.

Efficiency Arguments for Equalization

To the extent that any factors of production (i.e., the various types of labour and capital) are mobile between provinces, economic efficiency will require that they be allocated in such a way that the productivity of the last migrant (or unit of capital) is roughly equal in the sending and the receiving province (abstracting from migration costs). Otherwise, the total national production of goods and services could be increased by further reallocations. In other words, if the additional amount of production contributed by a migrant is less in the province of destination than it was in the province of origin, total national production will be less than if the migrant had not moved. In terms of national economic efficiency, the migration of individuals will be desirable only if it leads to an increase in the aggregate production of goods and services. The same argument holds in the case of capital mobility.

Can we expect the free interprovincial movement of factors of production in response to market forces to achieve such an efficient allocation? In the presence of (unequalized) differences in NFB's between provinces, the answer is negative. We illustrate this by considering a particular type of labour (based on education, skill levels, etc.).[1] Roughly speaking, workers with any particular set of these attributes will move from one province to another if they expect to become better-off by doing so. Aside from migration costs, the most important factors related to the economic well-being of these workers in the two provinces are their personal market incomes and their net benefits from provincial fiscal activities (that is, their share of provincial services less taxes paid).

Since private property income (interest, dividends, capital gains from stock holdings, etc.) generally bears no relation to where a person resides, we can conclude that workers will tend to move from one province to another when the sum of expected wages and NFB's is greater in the province of destination than in the province of origin. There will be a "migration equilibrium" for a particular type of worker only when these sums are similar in all provinces. It follows that if there are any interprovincial differences in NFB's and if labour responds to these differences in its decision to migrate, wage rates will also tend to be different between provinces. Since workers are generally hired and paid according to their productivity, this means that potential migrants will have different productivities in different provinces. As we have seen, this implies an inefficient allocation of this type of labour between provinces.

What fiscal measures would tend to reduce or eliminate this inefficiency? The solution is an equalization program that would serve to eliminate all interprovincial differences in NFB's from provincial budgets. To arrive at the same conclusion, economic efficiency would require that factors of production be guided between activities (including those in different provinces when this is an option) by signals related to their productivity in these different locations. Differences in NFB's between provinces tend to distort the market signals that would be expected to do this job. The only solution is to eliminate the source of the problem – namely, the differences in NFB's from provincial government activities. This is true regardless of whether these differences arise from source-based or residence-based tax collections.[2]

Thus economic efficiency calls for full equalization of interprovincial differences in NFB's from provincial government activities. Assuming that provincial budgets are of the same degree of progressivity as a system that distributes expenditures on a per capita basis and raises income taxes on a proportionate basis, this would require equalization of all interprovincial differences in per capita expenditures financed from all tax sources.[3]

Under one particular judgment regarding property rights to provincial tax sources (i.e., that no one has an inherent right to fiscal benefits that accrue by virtue of residing in a province with above-average tax capacity), the same equalization program is called for on grounds of equity. While we can sympathize with this view, we also recognize the constitutional powers over natural resources that were granted to the provinces under the BNA Act. These powers might be interpreted as granting certain property rights to the residents of a province over that province's natural resources. The implication of this judgment, as we have seen, is that on equity grounds provincial expenditures financed by natural resource revenues should be treated differently in an equalization program; only a portion of them should be equalized, with the proportion determined by the overall marginal federal tax rate.

We conclude, therefore, by noting that there might be some conflict between the criteria of equity and economic efficiency for an interprovincial equalization program. Equity considerations might call for less interprovincial redistribution of resource revenues than economic efficiency considerations. The efficiency costs of pursuing the equitable equalization program under this view might be construed as a cost of delegating power over resources to the provincial governments.

In order to provide insight into some of the implications of our analysis, we devote the following section to an appraisal of some important aspects of the equalization program currently in force in Canada and to some alternative views on equalization.

An Appraisal of Equalization in Canada

The Current Program

The equalization formula currently in effect (and due to be renegotiated in 1982) encompasses virtually every revenue source available to the provinces.[4] Except in the case of resource revenues, the formula brings up to the national average those provinces which would receive less than the national average in per capita provincial revenues if they applied the national average tax rates to their own provincial tax bases. Resource revenues are equalized only to one-half of the national average and are subject to an upper limit of one-third of total equalization payments. Ontario, however, is explicitly excluded from being a recipient of equalization payments. It should be mentioned also that there exist other transfers and policies that have an implicit equalizing component in them, and these ought to be taken into consideration in any general appraisal of the system. As mentioned before, these cause "second-best" problems that are not being taken into account here.

If we compare this system with the ideal system derived under the assumption of broad-based horizontal equity and provincial redistribution of the type considered in Chapter 5, we find several differences. The first is that the formula equalizes tax capacities rather than actual revenues. We have already mentioned the justification for this. Any system that equalized actual revenues collected would have severe disincentive effects. Provinces would be reluctant to raise sufficient tax revenues on their own if they were guaranteed them by an equalization scheme. An effective system cannot depend so directly upon tax effort; thus the existing formula seems a reasonable compromise.

The second difference is that the ideal scheme would require no net contribution from the federal government since well-to-do provinces would have negative contributions that would just cover the entitlements of the have-not provinces. The existing system only makes payments to the have-not provinces and finances them from federal revenues. What is unfortunate is that a good part of the funds used to finance equalization comes from taxes borne by the residents of the have-not provinces themselves. This is especially true when the equalization entitlements arise on account of revenue sources to which the federal government has no access, such as resource royalties. On economic grounds, it is hard to justify such a system.

The other important difference has to do with the treatment of resource revenues, which are equalized only to the extent of one-half. There are two ways that one can justify this treatment: one is clearly convenient; the other is substantial. As for the first, one can view the leniency afforded resource revenues as a *quid pro quo* for the fact that some implicit equalization is already taking place by way of price controls on oil and natural gas in Canada. More subtly, we could also justify it on the grounds that the implicit rents on hydro-electricity, especially in Ontario and Quebec, do not find their way into the equalization formula at all. We discuss this further in the following section.

The more substantive rationale for treating resource revenues more leniently has to do with the concept of equity that is used. Apart from the treatment of resource revenues, the equalization formula itself is consistent with the broad view of equity (entailing minimal provincial property rights). In the case of resources, however, the ethical appeal of the broad view of horizontal equity might be overshadowed by the right to resource revenues conferred upon the provinces by the BNA Act. One might therefore be justified in applying the broad view of equity to all provincial revenue sources other than resources and in applying the narrow view (provincial property rights over resource revenues) to the latter. This would be consistent with equalizing resource revenues to a much lesser extent than other revenue sources.

All this, of course, hinges upon the presumption that provincial government budgets are redistributive in the manner postulated and that the incidence of taxes and expenditures is as specified. These are matters on which empirical confirmation is a long way off. Any view of these matters must necessarily be judgmental. In our view, the assumptions made are reasonable.

The final major problem referred to above is the deliberate and arbitrary exclusion of Ontario. Under the current system for equalizing resource revenues, this exclusion means that every increase in the domestic prices of oil and gas induces a large net transfer from Ontario to the recipient provinces. There is no equity or efficiency justification in that.[5]

Some Notes on Alternate Views of Equalization

We conclude this chapter by using our framework to evaluate some other commonly held views on equalization and proposals for change in the current program. To some extent, this involves repetition of points made earlier; but we think it might be useful to focus attention on the similarities and differences between our views and those of others.

Equalization Should Be Replaced by a Negative Income Tax[6] — According to this view, equalization is a method of redistributing income from the rich to the poor. It is not a very effective tool for that purpose, since it redistributes income between governments rather than individuals and does not compel provincial governments to behave in such a way as to "improve" the distribution of incomes. In fact, there is the possibility that a program of equalization grants could ultimately result in income being redistributed from poor people in Ontario to rich people in Newfoundland.

Our own analysis shows that equalization is a necessary complement to any redistributive tax/transfer program based primarily on market incomes. Unless a negative income tax or other such program discriminated between individuals in different provinces on the basis of differences in NFB's from provincial budgets, horizontal and vertical equity could not be achieved. It is the role of an equalization program to make this possible.

Equalization Should Recognize Interprovincial Differences in the "Need" for, or Cost of, Public Services[7] — Two provinces may have the same revenue-raising capacity, but if it costs 50 per cent more to provide services (e.g., to build highways) in one than it does in the other, there should be some equalization transfer from the low-cost to the high-cost province. Perhaps one of the main reasons for such cost differences in Canada is the difference in provincial populations (e.g., Prince Edward Island vs. Ontario). Since many provincial services have significant fixed costs, larger provinces will be able to provide these services at lower costs per capita.

To take this phenomenon into account, we would have to modify our expressions for real income. In particular, we would have to introduce an adjustment for population size (or any other source of cost differences) to our previous index of NFB's, which were measured by tax revenues per capita. On equity grounds, it is clear that this modification would provide a justification for basing equalization on interprovincial differences in costs, as well as revenues. The efficiency implications of this argument, however, are not quite so clear. If provincial services are more costly in one province that in another, overall efficiency should require that this be taken into account in migration decisions. It is only if the cost differences are based on population size that an efficiency argument would hold for equalization on this account. The justification lies in the resulting externalities associated with migration; migration confers external benefits on the recipient province and corresponding costs on the "donor" province.[8] The size and direction of the required transfers would depend on the relative sizes of these two externalities and could be quite different from what is called for on equity grounds.

Another problem with adjusting for the need for, or the differences in costs of, services is the practical difficulty in actually calculating these differences in a mutually acceptable manner.

Nonrenewable Resources Should Be Treated Differently than Renewable Resources — Why should residents of Alberta provide transfers to the residents of other provinces on the basis of revenues from oil and gas resources that are in limited supply and will soon be depleted? The answer is quite simple. Equalization is based on current interprovincial differences in NFB's. If Alberta's source of excessive NFB's should disappear sometime in the future and not be replaced by some other source, its residents could well become net recipients of equalization transfers. By the same token, as stated earlier, the fact that Ontario has traditionally been a "have" province under the equalization formula does not justify making arbitrary adjustments to the formula to exclude it when its relative fiscal position begins to deteriorate. The relative fiscal positions of provinces are bound to change over time, and equalization transfers should adjust to take these changes into account. If Newfoundland's success with oil and gas should continue, it could well become a "have" province. Of course, if a province should choose to defer some of the fiscal benefits from a nonrenewable resource (as through the Alberta Heritage Fund, for example), this could be reflected in the equalization program; resource revenues could be counted as they were used rather than accrued.

Resource Revenues Should Be Equalized through Subsidized Resource Prices to Canadian Consumers — Through most of the 1970s Canadian oil and gas prices were held (under regulation) at levels significantly below world prices. The implications of this are, first, that Alberta's revenues from oil and gas were far less than they could have been in the absence of price regulation and, second, consumers of oil and gas throughout all of Canada "benefited" from the lower prices. In this sense, then, it is argued that Alberta has already made a substantial contribution to the equalization of oil and gas revenues and thus revenues from these resources should be excluded from the equalization program.

This proposition is inappropriate for several reasons. First, whatever the domestic price of oil and gas, the residents of producing provinces will almost certainly benefit from some NFB's arising from this source that will not be available to the residents of other provinces. As our analysis has shown, this creates efficiency and equity arguments for equalization on this account. Any subsidizing of oil and gas prices might reduce the potential magnitude of these effects, but it would be unlikely to eliminate them. Nor would such a subsidy create an offsetting set of NFB's in other provinces to eliminate the need for equalization; subsidized oil and gas prices would be enjoyed by all Canadians regardless of where they lived.

While "subsidized" oil and gas prices could reduce interprovincial differences in NFB's and thus, in that sense, serve as a partial substitute for the equalization of oil and gas revenues, they would be a very poor tool by which to accomplish the purpose. Canada is paying a high price for delaying its adjustment to world oil and gas prices. To the extent that the potential differential effects of higher prices on provincial governments is the reason for the delay, the need to reform the equalization program in order to take proper account of resource revenues becomes increasingly urgent.[9] The benefits from moving to world oil and gas prices in the presence of an appropriate equalization program could very well be major.

Some General Macro Indicator Should Be the Basis for Equalization Transfers — According to this view, equalization is simply a device for transferring money from high-income to low-income provinces; it verges on the view that equalization compensates for unevenness in the process of regional economic development. Under this view, then, it would be appropriate to base the size and distribution of equalization payments on some simple macro indicator, such as income per capita.[10] We see no justification for such a procedure. The efficiency and equity arguments for equalization that we have developed are based on interprovincial differences in NFB's from provincial government budgets. It is highly unlikely that a set of equalization transfers based on any macro indicator could match those that would be appropriate on the basis of interprovincial differences in NFB's. This would be especially true in the case of NFB's arising from resource revenues. The only possible advantage to a macro-indicator approach to equalization would be its apparent simplicity. Since, however, the current equalization program, based on complex measures of 29 sources of fiscal capacity in each province, has demonstrated itself to be computationally straightforward and inexpensive, we see no virtue in this argument.

Equalization Should Be Used to Compensate for the Effects of the Tariff and Other National Policies — The tariff and other aspects of Canada's national policies have been observed to have pronounced regional effects. In particular, the central industrial heartland is believed to have benefited at the expense of most other parts of the country (primarily the resource-based regions). These effects arise from the different patterns of specialization in production across the country. It is thus argued that a program of equalization transfers from provinces that have gained from the national policies to those which have been jeopardized would be justified on equity and efficiency grounds to compensate for these effects.

Looked at through the framework of our analysis, this case turns out to be quite weak. First, any effects of the national policies on real incomes will be reflected in wages, profits, and other forms of market income. Consequently, any undesirable redistributive consequences can be dealt with by using the traditional tax/transfer system. There is no separate justification in equity for an equalization program to compensate for the effects of national policies. Second, the efficiency case for equalization for this purpose is also quite weak. Consider the extreme case where the national policies are directed at a single industry located in only one province. The argument then goes that a transfer of income from that province to other provinces would decrease demand for the former province's output and hence counteract the inefficient production effects of the tariff. There is no presumption that this would happen, however. If the tariff-protected good were traded interprovincially (which presumably it would be under those circumstances) and if the marginal propensity to consume this good were the same in all provinces, the transfer would have no effect at all on total domestic demand for the protected commodity. And even if the transfer had some effect on total domestic demand, there is little reason to believe that total world demand would be affected. Finally, even if the transfer did have some desirable effect with respect to the production inefficiency cost of the tariff in the protected industry, it would likely introduce, at the same time, some new distortions in the interprovincial distribution of production of other commodities and would have no impact on the consumption cost of the tariff. We conclude, therefore, that equalization is at best a very poor tool for compensating for the equity or efficiency effects of the tariff and other national policies; more realistically, such use of equalization would be more likely to hinder the achievement of the stated policy goals.

Resource Revenues Should Be Equalized through a New Second Tier of the Program[11] — There exist numerous variations of this type of proposal for equalization, but most of them seem to be founded on two general observations. The first of these is the view that resource revenues are somehow quantitatively and/or qualitatively different from other revenue sources and hence deserve "special" treatment. We are in partial agreement with this. As pointed out earlier, there is an interpretation of horizontal equity, possibly consistent with interpretations of the BNA Act, under which the rights to provincial government resource revenues "belong" to residents of the province. Under this view, equity requires that interprovincial differences in NFB's resulting from resource revenues be only partially eliminated through equalization. On the other hand, the view of horizontal equity that, in our opinion, is most reasonable with respect to NFB's from all other revenue sources requires full equalization on their account. Consequently this would mean that resource revenues would be treated differently to achieve equity goals. On the other hand, efficiency goals would require full equalization of NFB's from *all* revenue sources. Any compromise between the imperatives of equity and efficiency, however, would still require a different treatment of resource revenues. The next step in the argument – that resource revenues should be equalized through a separate program administered by the provinces – does not follow from these observations. While such a separate program is not inconsistent either, we wish to express grave reservations about the long-term stability of an arrangement whereby resource-rich provinces would agree to voluntarily transfer significant portions of their resource revenues to the other provinces.

The second general view that prompts the idea of such a two-tier equalization program is that the federal government cannot, or at least should not, equalize with respect to revenue sources to which it has no access. In the current Canadian case where massive oil and gas revenues accrue in one small (with respect to population) province, this is a real concern. For the federal government to be able to finance the transfers that would be required to effect a net equalization scheme, without having any direct access to oil and gas revenues, would require extremely high tax rates over its traditional revenue sources. Indeed, it seems conceivable that under world pricing of domestic oil and gas federal income tax rates might have to exceed 100 per cent! Since we do not hold out much hope for the prospects of an interprovincial equalization scheme, we would have to conclude, under such circumstances, that it is necessary for the federal government to have access to oil and gas revenues. This does not seem to be an unreasonable suggestion, since the federal government already collects considerable revenues from oil and gas. The recently concluded energy agreements between the federal government and the provinces can be viewed partly as a means of financing equalization payments.[12]

While we would have no objection to having the federal government operate two separate equalization programs in order to give some special treatment to resource revenues, our analysis does not suggest that either special treatment or a separate program is required.

The November 1981 Federal Budget Proposals — As part of the budget of November 1981, the federal government proposed to change the equalization scheme substantively, beginning at the time of its renewal in 1982. With respect to the present system, three main changes were to be introduced:

1/ The base of the equalization formula was to be expanded to include municipal property taxes. This implies that virtually all provincial and municipal tax revenue sources would be included in the base.

2/ The preferential treatment of resource revenues would be removed from the base, in the sense that 100 per cent of provincial resource revenues would be included. Thus the formula *per se* would not discriminate in favour of resource revenues.

3/ Instead of being based upon national average tax revenues, the equalization formula would be based upon Ontario's tax capacity. In other words, a have-not province would receive the difference between the national average tax rate applied to the Ontario tax base per capita and the same rate applied to its own base per capita.

The implications of such a scheme are quite startling. In itself, the full inclusion of municipal tax revenues and resource revenues would appear to broaden the scheme sensibly to include all tax revenue sources. There is no good reason to exclude municipal property taxes. As for resource revenues, their full inclusion can be justified both on efficiency grounds and on the grounds of the broad view of equity. One could, of course, argue that full inclusion of resource revenues violates the BNA Act and therefore they should be preferentially treated. It was not obvious that the existing method was the most suitable way to implement the narrow view of horizontal equity with respect to resource revenues.

It is the use of the Ontario standard that causes the most striking consequences. For one thing, this automatically excludes Ontario from receiving equalization payments. This exclusion is completely arbitrary and makes no sense in terms of the equity and efficiency goals of equalization. As we have argued in this study, the latter call for the use of national averages. The use of the Ontario standard also effectively eliminates the equalization of oil and natural gas revenues of the "have" provinces. It does this, because the scheme is not a net scheme and because Ontario has no oil and gas revenues as part of its tax base. On the other hand, those have-not provinces which acquire oil and gas revenues will have them *fully* equalized away! This seems quite perverse. By the same token, any movement of firms from a have-not province to Ontario could end up benefiting the province from whence they came, as has been pointed out by the Quebec government.

Presumably the choice of Ontario as a standard and the implicit exclusion of oil and gas revenues from the western provinces was motivated by the problems that arose in the past with the financing of equalization. While this may have been a major problem in operating a gross scheme based upon national averages in the past, the financing difficulties have been considerably overcome with the signing of oil and gas revenue-sharing agreements between the federal government and the producing provinces. As we have argued elsewhere (Boadway and Flatters, 1982), these agreements can be thought of as partly financing equalization. There does not appear to be any sound economic grounds for excluding oil and gas revenues from equalization.

Notes

CHAPTER 1

1 See, for example, the discussion in Fowler (1981), p. 101.

2 Quebec never participated in these tax rental arrangements at all; instead, it received an abatement from 1952 on. For a full description of earlier arrangements, see Moore, Perry, and Beach (1966).

3 Quebec is not a participant in the tax collection agreements; Ontario and Alberta collect their own corporate taxes but allow the federal government to collect personal taxes on their behalf.

4 Oil and natural gas revenues began to be treated differently during the 1972-77 Agreements, following the rapid escalation of world prices. From 1975 onwards, full equalization was applicable only to the 1973-74 level of oil and gas revenues. Those above that amount were only one-third equalized.

5 For example, see Oates (1972), Musgrave and Musgrave (1976), Boadway (1979, 1980), Atkinson and Stiglitz (1980), and Breton and Scott (1978).

6 See also the discussion of higher education grants in Trudeau (1968).

7 This, of course, will not always be the case, since some functions of the federal government may be much more efficiently allocated to the lower levels of government. The so-called assignment problem of fiscal federalism is concerned with the economically efficient degree of decentralization. See the discussion in Oates (1972), Breton and Scott (1972), Boadway and Norrie (1980), Usher (1980), and West and Winer (1980).

8 To this has been added the inefficiencies arising from the sharing of resource rents on the basis of residency, so important in the Canadian context. Recent literature on this subject includes that of Flatters and Purvis (1980), Helliwell (1980), and Courchene and Melvin (1980).

9 A similar phenomenon had been discovered in an unpublished paper by Vardy (1972). Subsequent refinements of this model may be found in Stiglitz (1977), Hartwick (1980), Starrett (1980), and Lange (in progress). For a technical survey of the literature, see Boadway and Flatters (1981).

10 This is shown in Boadway and Flatters (1981).

11 One exception that has come to our attention is a Ph.D. thesis by Douglas Patriquin, done for the London School of Economics.

12 Discussions of the Established Programs Financing grants may be found in Courchene (1979), Carter (1977), and Boadway (1980).

13 Musgrave (1961) presents a taxonomy of the various sorts of formulas incorporating these criteria.

14 A summary of the various types of grants from the federal government to the provinces may be found in Federal-Provincial Relations Office (1977).

CHAPTER 2

1 For a spirited defence of these procedures, see Harberger (1971). Although virtually all economic analysis adopts this convention when analysing economic efficiency (it is, for example, the basis of cost-benefit analysis), there are some unresolved disputes in the theoretical economic literature about whether this is a legitimate way to abstract from equity issues. See, for example, the analysis in Boadway (1974).

2 For a general discussion of the implications from being able to compare welfare levels and welfare changes, see Sen (1977).

3 These shortcomings are discussed fully in Feldstein (1976) and Musgrave (1976).

4 Governments are not always successful at redistributing from higher- to lower-income persons. What is done by the progressivity of the income tax may be undone by the regressivity of other taxes and expenditures; see Gillespie (1980). Nonetheless, public pronouncements as to the desirability of redistribution, and especially as to the redistributive goal of equalization, are such as to convince us that this is a widely accepted goal of society.

5 Since municipalities are creatures of the provinces, we include their taxes under provincial taxes and assume that they are thus potentially subject to equalization, if so desired. We ignore intraprovincial differences in property taxes, although, in principle, our analysis could be amended to incorporate them.

6 This assumes an equal number of residents in provinces *A* and *B*. Note also that an equivalent result could be obtained by interindividual transfers, whereby the federal government would take $1,000 from each person in *A* and transfer that amount to each person in *B*. The federal equalizing scheme could always operate

either through intergovernmental grants or interpersonal grants based upon province of residence. We shall discuss in later chapters why one might prefer intergovernmental to interpersonal transfers, using the tax system.

7 A taxonomic discussion of various intergovernment transfer schemes, incorporating varying amounts of tax effort, tax capacity, and other properties into the formulas can be found in Musgrave (1961).

8 We use the term quasi-private to reflect the fact that although the goods and services provided by the provincial governments are private rather than public in nature, they are provided by the government and need not correspond to the amounts that would have been purchased in decentralized private sector markets.

9 This corresponds to what Buchanan (1950) called the difference in fiscal residuum.

10 See, for example, Flatters and Purvis (1980), Helliwell (1980), or Courchene and Melvin (1980).

11 For example, Helliwell (1980) has calculated the present value of resource rents to residents in Alberta to be $81,000 per capita.

CHAPTER 3

1 This is a slight simplification of reality since the main capital tax – the corporation income tax – is levied only on capital in the corporate sector. Both the capital and land taxes can be viewed as including property taxation.

2 There is some empirical evidence that local public expenditures are of a private nature. See Borcherding and Deacon (1972) and Bergstrom and Goodman (1973). We should point out here that local governments (municipalities) are being included in provincial governments for the purposes of our analysis. Thus, equalization should include municipal taxes where appropriate. There is, of course, the additional problem that municipal tax rates and services are not uniform within provinces. We ignore that problem. Our analysis can be taken to apply for the average municipal government within a province.

3 Recall the assumption that provincial budgets are distributionally neutral. This particular conclusion will not generally be true when we allow for non-neutral provincial behaviour (see Chapter 5).

4 There may still be a variability in factor supplies within provinces so that one might not wish factor incomes to be fully equalized for efficiency reasons. It should be noted that we are ignoring, at this stage, the inefficiencies that arise out of the different provincial tax rates on capital, which can result in capital being allocated inefficiently over provinces. This we shall discuss later.

5 Notice that this problem would arise whether the equalization took the form of grants to provinces or to individuals.

6 We shall see in later chapters that the precise set of tax bases to be included in an equalization program will depend very much on assumptions about the incidence of taxes and government expenditures.

7 Here, we are actually assuming implicitly that the marginal migrant is the representative citizen. It might be better to regard this type of economy as one in which all persons are identical.

CHAPTER 4

1 Copithorne (1979) argued that factor-price-equalization results should hold among Canadian regions even in the presence of natural resources that are industry-specific.

2 Harberger (1962) argued that capital taxes are borne mainly by capital; Brittain (1972) put forth the same argument about taxes on labour. For a general survey of tax incidence, see Mieszkowski (1969).

3 Incidentally, it is well worth stating that the same principles that apply to interprovincial equalization payments also apply to the equalization of municipal tax revenues within a province. The discussion of property taxes presented below is particularly appropriate to that case.

4 There will also be a dead-weight loss associated with these indirect taxes, which will reduce real incomes by more than would be indicated by the tax revenues gathered. We have neglected this source of change in real incomes. Apart from being hard to measure precisely, it is unlikely to be of a large relative order of magnitude.

5 This is certainly the view of most authors who attempt to measure the incidence of taxes; see, for example, Gillespie (1967) and Maslove (1973).

6 It should be recognized that if the province also faces fixed required rates of return on its capital, the property tax will ultimately be borne by other factors of production. This does not affect the logic of our arguments. Once again, there will be dead-weight losses associated with these taxes. For obvious reasons, they would be difficult to incorporate into an equalization scheme.

7 Copithorne (1979) argued that this was the case in the B.C. forest industry.

8 See the analysis in Boadway and Flatters (1981) for a treatment of this case.

CHAPTER 5

1 Rewrite equation 5.1 as follows:

$$Y^i_e = PI^i_e - t^i_{ye}(PI^i_e) + \alpha^i_e t^e_y (PI^i_e)$$
$$+ \alpha^i_e (t^e_K r_e K_e + t^e_N s_e N_e),$$

where PI^i_e is individual i's personal income and ΣPI^i_e is total personal income in the province. Then equation 5.2 will be true if, and only if,

$$\frac{t^i_{ye}(PI^i_e)}{t^e_y(\Sigma PI^i_e)} = \alpha^i_e.$$

2 For example, it is easy to see that if the provinces did not use their equalization entitlements (positive or negative) to change the level of benefits they provide, the fiscal residuum would not be eliminated. Suppose that the provinces used the entire amount of their equalization (+\$500 and −\$500) to change their tax rates, keeping benefits constant. They would effectively be pursuing different distributional policies. Simple calculations will show that with equalization the rich in province *A* would lose \$533 on net from the activities of the province, while the poor would gain \$567. In *B* the rich would lose \$417, and the poor would gain \$458. The fiscal residuum would not be eliminated. The rich would be better-off in *B*; the poor would be better-off in *A*. No equalization scheme could eliminate the fiscal residuum; it could only make it financially possible to do so.

3 In the examples given so far, we calculated the equalization entitlement on the basis of the *ex ante* observed incomes and tax rates. Of course, in practice, equalization entitlements are calculated in the presence of equalization payments, so that provinces have had time to adjust to them. It is easy to verify that the equalization entitlement will still be correctly calculated by the existing method when the calculation is continually done in the presence of equalization, provided as always that the provinces are redistributing in a uniform way, as discussed.

4 Once again, it does not matter where we start so long as all provinces agree upon the redistribution in the end. The final result will be the same regardless of the starting point, provided the proper *ex post* equalization scheme is established.

5 See Boadway (1980), Courchene (1979), and Carter (1977) for descriptions of the EPF system.

CHAPTER 6

1 Capital being highly mobile and therefore less subject to large interprovincial differences in NFB's than labour, we thought it more appropriate for the purpose of this summary to discuss efficiency and equalization as it relates to labour.

2 The same qualifications concerning Heritage Funds and hydro rents that were discussed above in relation to equity issues apply to this discussion of efficiency.

3 See note 2.

4 A major share of municipal property taxes is not included. As well, the sale of Crown leases on oil and gas property is excluded.

5 See Flatters and Purvis (1980) for an elaboration of this.

6 For this argument, see Courchene (1978).

7 The Rowell-Sirois Commission advocated equalization on the basis of fiscal need.

8 See Flatters, Henderson, and Mieszkowski (1974) for an elaboration of this argument.

9 This theme is developed in greater detail in Flatters and Purvis (1980).

10 For a specific proposal along these lines, see Davenport (1979).

11 See Courchene (1979).

12 For a further analysis of this, see Boadway and Flatters (1982).

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